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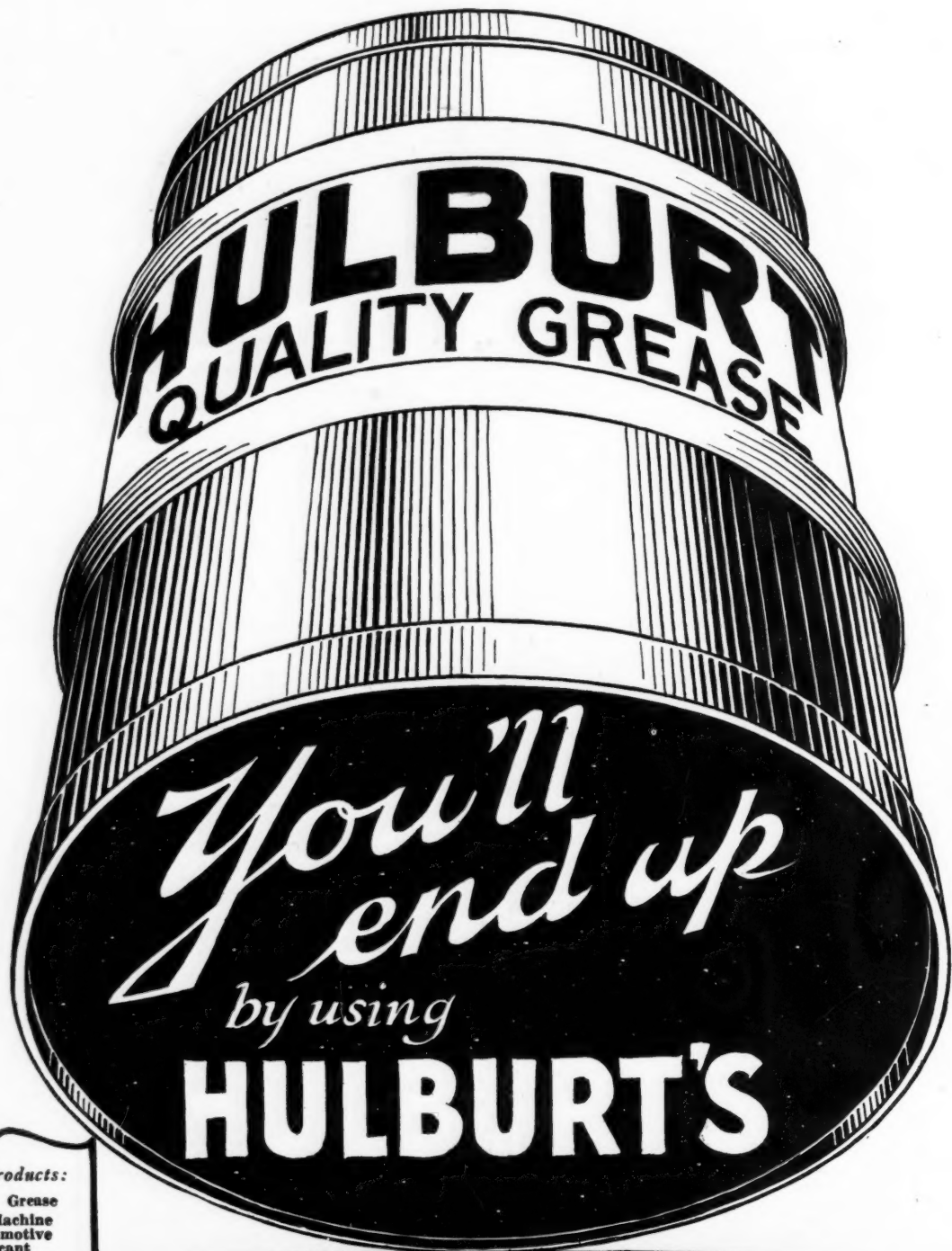
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Lake Rate War Revived

THE LAKE CARGO coal cases, in which a decision was handed down last summer, have been reopened by the Interstate Commerce Commission. Interested parties are given until March 22 to say whether they desire to submit additional evidence. That advantage will be taken of the Commission's offer is a foregone conclusion.

These rates have been before the Commission in one form or another since 1912. Involved in the question is the bitter struggle between Ohio and Pennsylvania, on the one hand, and southern West Virginia and eastern Kentucky, on the other, to dominate the coal tonnage of the Northwest. In the background hovers the spectre of union vs. non-union labor.

A simple transportation question has become a big economic issue, clouded by political manoeuvring. The issues in these cases, their transportation, economic and political background, will be reviewed in next week's issue by Sydney A. Hale.

Light on Fan Construction

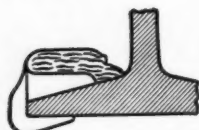
VENTILATING engineers say that our coal-mine fans are behind the times. Experience in the ventilation of factories and schools and in the supply of air to furnaces has resulted in wonderful progress in the theory and practice of ventilation.

L. W. Huber will discuss next week the fan that has blades so turned that it seems as if the designer desired them to avoid moving the air. But such fans when driven at high speed are efficient and give unusually stable conditions. They use almost the same horsepower and give almost the same quantity of air despite changes in pressure such as would entirely unbalance a fan with forward-curved blades. That uniformity of horsepower is good for the fan, and the uniform air flow is an essential factor in promoting safety. But as to the desirability of these high-speed fans for mine use there is much difference of opinion.



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Devoted to the Operating, Technical and Business
Problems of the Coal-Mining Industry

R. Dawson Hall
Engineering Editor

Volume 29

NEW YORK, MARCH 11, 1926

Number 10

The Coal Myth

WHAT everybody believes is likely to be in the main untrue, for, when all are agreed, then exaggerations are inevitable, statements are not questioned or examined and no one fears to give rein to his imagination. So it has been with the coal industry. It has been declared the worst of all the world's institutions. It has been the prey of masters of superlatives. Is it sick? There is none more sick. Is it overdeveloped? None is more so. Is it irregular in operation? None works more irregularly. Is it deficient in mechanicalization? None is more deficient.

Some time when coal has partly re-established itself by a superhuman effort we shall begin to see it in its right light. Day laborers at mines, for instance, who get \$7.50 for an eight-hour day will be seen to be better paid than snow shovelers who work for ten hours and obtain a wage one-third lower, paying also more for shelter, transportation, food and comfort than the laborers at coal mines. Some day the irregular trades will be examined, and coal will be seen to be nowhere in the running. Some day the primitive industries will hold a congress and refuse to recognize such a well-developed and highly mechanicalized industry as coal mining. Some time the miner will be seen not as a feudal serf but as one of the more independent of artisans. There will come a day also when we shall see the industry as one in which the operators are grossly undercompensated. The world is happy in having a myth, a scapegoat for simple minds to discuss. We have so many difficult problems to solve. Here is something we all agree on—a story which we can believe without doubt or question. Why then trouble about the facts!

Talleyrand de Périgord said history was "a fable agreed on." That expression will serve to describe the coal industry until someone comes to shatter our faith and to convince us once more that the more superlatives there are in an assertion the more unsafe it has become. If all that has been said of the coal industry is true there is no certainty in human nature.

Snap Judgment

AT A MEETING of the Chamber of Commerce of the State of New York on Feb. 4, its committee on public service was asked to investigate coal prices in New York City. On March 4, the committee reported that it was "quite apparent that profiteering is and has been going on" and that this price-gouging "is not confined to the cellar dealer or peddler." Mark-ups of 54 to 106 per cent by those distributors of fuel in bag lots did not impress the committee as exorbitant. Large retailers, stated an appendix to the report, "must bear some share of responsibility for oppressive prices."

The mandate to the committee was "to ascertain the facts concerning the relation between the cost of coal

delivered in New York and the price demanded by retail dealers of all classes." Yet, nowhere in the report is there any evidence that the committee had any accurate knowledge either of mine prices, prices at tidewater or the cost of handling coal through the retail pockets. The text of this document reveals a clouded conception of the different agencies of coal distribution and their respective functions. The only statement purporting to represent wholesale prices made on the committee's authority is a hopeless jumble of mine prices on domestic anthracite, tidewater quotations on bituminous mine-run and retail delivered prices on coke.

The committee excuses its failure to develop all the facts called for in its instructions by pleading that the task was difficult and that it lacked authority to compel the submission of pertinent data. The evidence gathered, it says, was conflicting—but the imperfect record did not deter it from pronouncing judgment and from making recommendations for legislative action. Just how difficult it would have been to gather the necessary information is lost in mystery. There is, however, nothing in the report to indicate that the committee or its paid investigators unduly exerted themselves to carry their studies beyond the peddler to apportion responsibility and, if need be, condemnation.

For seventy-five years it has been the proud boast of the Chamber that it has taken no action upon questions "we confessedly do not feel ourselves qualified to judge." In the present case, however, the Chamber has seen fit to accept and indorse a report the imperfections of which are patent and in the face of a request from the chairman of the state relations committee of the New York State Coal Merchants' Association that the retail trade be heard before the Chamber committed itself. This departure from well-seasoned tradition hardly adds to the glory of the Chamber of Commerce of the State of New York.

Liquid-Oxygen Explosives

DURING the past few years much interest has been shown in this country concerning the use of combustible matter soaked in liquid oxygen as an explosive for use in industrial blasting. Perhaps it would be more proper to say "curiosity" than "interest," because up until quite recently everybody was mildly anxious to know more about this explosive, its possibilities and limitations; yet nobody seemed to be doing anything in particular about it.

As is well known, explosives, from the chemical standpoint, are of two general types—compounds and mixtures. High explosives are usually compounds while the mixtures are, as a rule, slower in their action because they evolve their gases from actual combustion which progresses from particle to particle. Common black gunpowder is an excellent example of a mixture explosive.

Liquid-oxygen explosives partake of the nature of mixtures although in many respects they behave much like dynamite which is a good example of a chemical compound. We print elsewhere in this issue an abstract of the extremely valuable paper on this subject recently presented before the American Institute of Mining and Metallurgical Engineers. This will be of keen interest to many mining men.

Several characteristics of the new explosive recommend it for strip pit mining and tunnel work in rock although its heat of explosion and quickness of action unfit it for shooting coal. The rigidity of the cartridges and the fact that the smaller sizes, in order to even approximate their possibilities must be fired within 10 to 15 min. after their placement in the shot hole are detrimental qualities.

It is in the strip pit and rock quarry, therefore, that the new explosive can be used to best advantage. Here the 4-, 6-, or 8-in. drill holes used permit the employment of cloth-bound cartridges of large diameter which may remain in place as much as 2½ hr. before firing and yet evolve a large proportion of their maximum possible energy. Another interesting feature of the liquid oxygen cartridge is the fact that it is entirely successful in wet holes or may be used with water stemming. Such stemming soon freezes after insertion of the cartridge.

Other excellent characteristics of the new explosive are its freedom from detonation by impact and the fact that it must be used practically as soon as it is manufactured. The cartridges may be made up at any time and can be safely stored in any quantity as they do not become explosive until soaked in the liquid oxygen. Atmospheric conditions have small effect upon them when either soaked or unsoaked. Furthermore their total cost as used is somewhat less than that of dynamite.

An operation using this explosive needs neither magazine nor thaw house. In its stead a suitable place must be provided for the storage of detonators, fuse and cordeau. Similarly a small oxygen plant must be installed as well as a place for soaking cartridges. However, in addition to a decreased expense all or practically all of the danger incident to storing, transporting and handling high explosives is eliminated while the useful effects realized are approximately the same.

It is reported that liquid-oxygen cartridges are being used at a large coal stripping operation in Indiana for blasting the overburden ahead of the stripping shovels. The progress of this work will be watched with more than usual interest by the rest of the coal industry.

"Bootlegging" Coal

SOME have wondered how the miners met the long strike without any large withdrawal of savings funds and without any extensive measure of relief from the public, the trades unions in general or their own union. Many of them wandered to the big centers of industry such as New York and Pittsburgh and obtained work there. Perhaps in all 20 per cent of the workers left the anthracite region.

Some were reported in the bituminous mines, and, in one case at least, they were willing to perform more dead work without compensation than were the miners of the locality they invaded. A room had caved in, and

the anthracite men consented to clean it up without charge in order to get the opportunity to mine the coal after the face was reached. Being away from their own homes they did not hesitate to create conditions that they were unwilling to introduce or afraid to practice in their home mines. Their action was equivalent in character to the "dumping" policy of manufacturers who relentlessly demoralize distant markets but are careful of their own.

Many miners, however, did not move away but lived on the earnings of wives and daughters employed in the silk mills. Silk manufacturing is a great industry in the anthracite region, because the air is not sullied with soot and because there is an abundance of female labor.

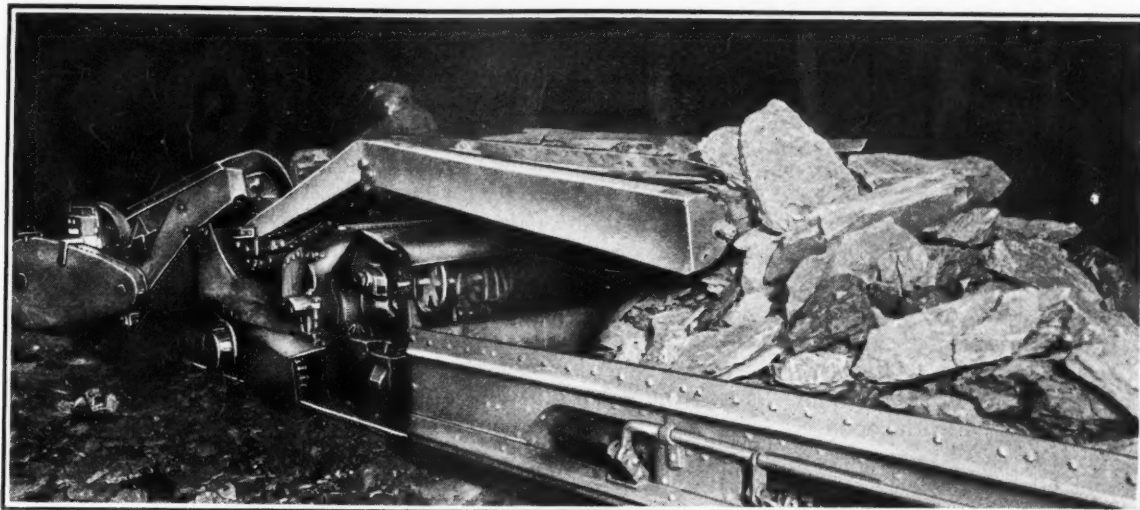
But there was another industry available and that, strange to say, was coal mining—"bootlegging" coal. The miners would not work for the companies, but they were willing to extract coal from the culm banks. Great activity was shown in this industry. The miners, each for himself, paid a high royalty on this coal to the owner of the culm bank. Teamsters hauled it short distances, and even into New Jersey. These "snow-bird" operators made \$7 or \$8 a day, and the coal, improperly prepared and containing large quantities of slate and bone, was sold at premium prices. These men, so long as the winter lasted, did not find their strike unprofitable. The distant cities had to do without anthracite but the home towns and those around the region had hard coal—of a sort.

The operators made no complaint. It is usually found that when these disagreements occur the owners of mines have a sympathetic eye to the sufferings that the men have brought and are bringing on themselves. They find it difficult to distinguish those who are the mere victims of circumstances that they cannot control from those who have invited misfortune by advocacy of a dogged resistance.

Many years ago a bituminous strike occurred during which one company, having a large store and being obliged to refuse credit to the idle miners, was importuned to lend the services of its mules and teamster to the miners. This was conceded and the men were soon scouring the surrounding country for farmers ready to supply them with food. In most instances the aid was afforded, and much provender was brought in as the farmers were at that time more friendly to the miners than today, partly because wages were lower but more because the farming population had furnished many recruits to the coal industry. Even the company stores have not infrequently extended credit to the friendly miners and those whose financial difficulties appealed to the store management; and then when the bars were let down it was difficult to separate deserving from undeserving.

A Gambler's Chance

NOT a few mines covered with untreated, combustible dust are in operation. It must be true that mine officials and the higher executives are now thoroughly aware of the degree of inflammability of coal dust. With little doubt therefore those who allow combustible dust to accumulate in large quantities without attenuating it with rock dust, or even so much as soaking it with water, are deliberately taking a gambler's chance in hoping for freedom from disaster.



Shoveling Machines Reduce Costs and Speed Rock Removal

Particularly Useful With Uncertain Roof and Rolling Bottom—Can Clean Up Rock Faster Than All the Men That Can Be Gotten Around a Fall

By Frank H. Kneeland

Associate Editor, New York, N. Y.

MANY mines are afflicted with a rock problem more or less severe. Sometimes the thickness of the coal is such that the roof must be brushed in order to secure the necessary headroom on haulage-ways and entries. As a rule all such rippings must be removed from the mine and disposed of outside. Again, in many cases the bottom must be lifted either to give the necessary headroom or to afford a reasonable grade for the haulage. Particularly where the coal is thin and its contour uneven either or both of these methods must be followed if anything resembling favorable haulage conditions are to be approximated.

Such are the conditions encountered in a certain group of mines in Kentucky. The thickness of the coal in these operations ranges from approximately 3 ft. 6 in. to about 5 ft. Local dips and rolls are numerous, and there is scarcely a haulage road to be found in these mines anywhere that does not require grading. In many places, also, the roof caves, sometimes to a height of 20 ft. or more, necessitating the removal of large quantities of rock.

Shoveling machines have been adopted for this purpose, not only because they cheapen the process involved but also because they do the work more rapidly than all the men that could possibly be used to advantage. In a typical instance as will be described later the bottom was lifted to a maximum depth of 3 ft. throughout a distance of 245 ft. along one of the main haulage headings and all the material from this cut, amounting to 166 cu.yd. in the solid was loaded out over a week end.

Rock work on haulage roads is always expensive,

not alone because the material handled is worthless but also because only a limited number of men can be employed. Furthermore a fall on a main haulage blocks traffic on this roadway and may thus cause an indirect loss that may far exceed the direct loss represented by the expense of rock handling. It is in such places that mechanical means of loading, inasmuch as they are far more rapid than hand methods, are especially advantageous, and such means are accordingly employed in the mines to which reference has been made.

It has now been practically eighteen months since the first Myers-Whaley type of shoveling machine was started to work. The savings made by this loader, however, were such that a second machine of the same kind, size and model, was installed in January of 1925.

Typical examples of the work done by these machines are shown in the accompanying illustrations, Figs. 1 to 7. In Fig. 1 practically all the work was lifting bottom. The grade was made uniform from A to E with two cuts and two fills between these points. The first cut extended from A to B, a distance of 280 ft., the maximum depth of this cut being 3 ft., the total yardage being 202½ cu.yd. in the solid. The yardage of loose material or spoil handled would be roughly twice this amount or approximately 400 cu.yd. From B to D a short fill had to be made, material for which was obtained by shooting the roof at C. Only enough roof was shot down to make the required fill and the material thus obtained was allowed to remain where it fell, no work being done upon it other than leveling the surface sufficiently to enable the track to be laid satisfactorily.

From *D* to *E* the cut measured 295 ft., its maximum depth being 3 ft. The volume (in the solid) was 252.2 cu.yd., making nearly 500 cu.yd. of loose rock. It was not necessary to shoot top to secure material for the little fill from *E* to *F*. The maximum depth of this fill was about 1 ft. and material for it was readily obtained from the end of the cut from *D* to *E*.

Fig. 2 shows how an abrupt dip was straightened out and excessive grades avoided. It represents another case of both brushing top and lifting bottom. Here the maximum fill was 15 ft. and the maximum cut was only 2½ ft. The total length of the fill was 630 ft. and of the cut 220 ft. The material blown down from the roof was 2,100 cu.yd., of which the shovel loaded out 942½ cu.yd., both figures representing material in the solid. The volume of rock removed from the cut was 150 cu.yd. measured in the solid.

Fig. 3 represents a case similar to Fig. 2 in that both a cut and fill are involved. The maximum depth of fill here was 10 ft. and its length to 470 ft. The volume of material shot down was 1,332 cu.yd. in the solid, of which it was necessary to move with the shovel 642½ cu.yd. also in the solid or roughly 1,280 cu.yd. of loose rock. The cut was about 130 ft. in length and its maximum depth approximately 2 ft.

Fig. 4 shows a long cut, so long, in fact that its extremities are omitted from this drawing, only 850 ft. of its length being shown. The maximum depth of this cut was 5 ft. 6 in. The spoil amounted to 1,108 cu.yd. in the solid, or approximately 2,200 cu.yd. of loose rock. As may be seen, however, the track grade obtained was excellent, the many humps and hollows originally existing being replaced by a level stretch of track and a uniform slight grade over which heavy trips can be hauled with comparative ease.

Fig. 5 shows a long heavy roof fall. For a distance of 950 ft. the top of this entry fell to a maximum height of 14 ft. 6 in. The above statement is misleading in that the fall did not take place entirely unaided. When the timbers along this heading began to show signs of

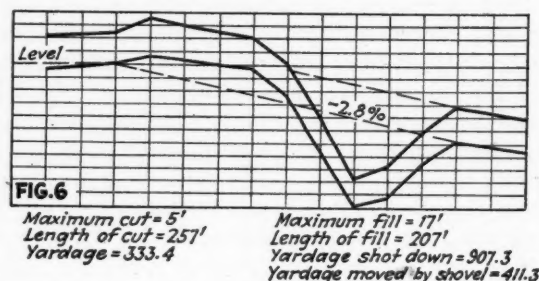
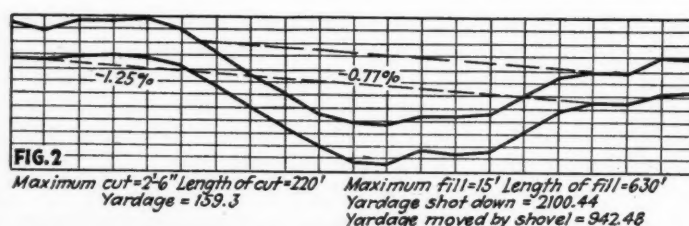
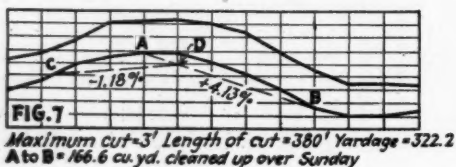
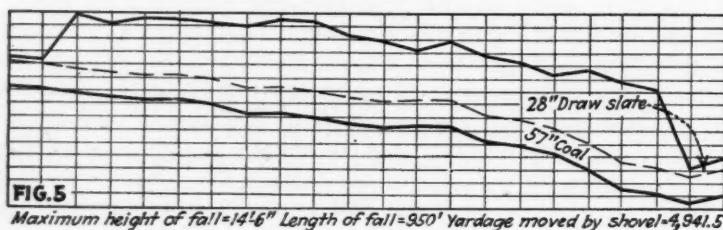
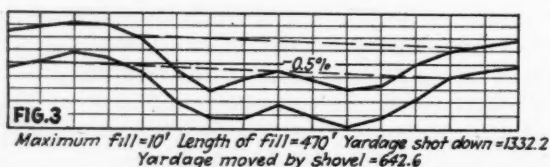
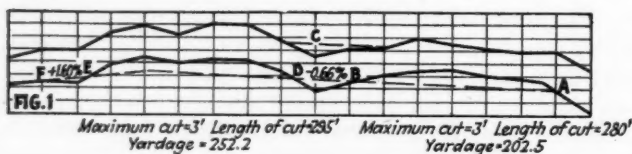
distress and failure, the roof was drilled and shot, bringing rock and timbers down together. The rock was then loaded out, many of the timbers being reclaimed in this process for use elsewhere. In this particular fall 4,941 cu.yd. of material in the solid were loaded by the shovel, slight inequalities in the floor being filled in the process. The actual yardage of loose material loaded and hauled away thus amounted to almost 10,000 cu.yd.

Fig. 6 is another case of both a cut and a fill, but in this instance the fill was unusually thick and heavy. It was made in a sharp local dip where the pitch of the coal at one end was so steep that a locomotive could not ascend with more than one or two cars and not even then unless it had a running start. To overcome this difficulty the roof was shot down to a maximum depth of 17 ft. and over a distance of 207 ft. A total of 907 cu.yd. of solid rock was thus brought down, of which 411 cu.yd. were loaded out.

Bordering this dip on the left was a roll. Here the bottom was shot up over a length of 257 ft. and to a maximum depth of 5 ft. All of this material amounting to 333 cu.yd. of solid rock was loaded out by the shovel. The resulting grade now has an inclination of 2.8 per cent against the loads, whereas originally the maximum grade had been one of 22 per cent against them.

Fig. 7 shows how a hump or roll was cut down. This was on one of the main haulage roads and was causing much trouble. The improvement was accomplished in two operations, the first from *A* to *B* and the second from *C* to *D*. The total length of the entire job was 380 ft. and the yardage moved 322 cu.yd.

Probably the chief interest in this cutting down of a bothersome hump centers in the first cut made because of the rapidity with which the work was accomplished. The first cut was approximately 245 ft. long, its maximum depth about 3 ft. and its cubical contents 166.6 cu.yd. in the solid. Work of tearing out track was begun after the day's run on Friday. The track was removed, the place drilled and shot and all loose material loaded



Mine-Grade Adjustments in a Kentucky Coal Mine

Mechanical loading of rock, with an inexpensive means of removing it from the mine cars and disposing of it on the surface, made the work, though expensive, a notable economy in operation. The removal of the fissured rock shown in Fig. 5 eliminated heavy timbering and some danger from falling rock.

out by Sunday afternoon. The track was then relaid and was ready for traffic by Monday morning. In this case, however, the cut was accessible from both ends. Accordingly, one shovel started at A and the other at B, the shovels working toward each other. Thus, starting to shovel on Saturday morning, they met on Sunday afternoon, after loading as stated, 166 cu.yd. of solid, or approximately 325 cu.yd. of loose, bottom rock.

Rock shoveling in these mines is done mostly at night. Where no track is laid in the place ten 7-ft. sections of 40-lb. rail laid on steel ties have been provided. These can be laid section after section in front of the machine as it advances. Each of these sections is provided with fish plates which may be slipped over or a-straddle the webs of the rails of the track already in place and quickly bolted fast. At the first opportunity, usually the next day, this temporary track is replaced with one of a more permanent nature. Of course if permanent track is already in place and only the roof is to be brushed, the top is shot down directly onto the rails and the fall cleaned up without recourse to temporary track of any kind.

Speed of loading depends largely upon the conditions of the material to be handled and the distance over which both the loads and empties must be hauled. A car containing about 5 tons of rock can be loaded in about 5 min. This might be taken to indicate that 140 to 145 cars of this material could be loaded in the course of a 12-hr. night shift. As a matter of fact shifting cars and the breaking down of big lumps either with sledges, by hand or by mud capping consumes so much time that especially when cleaning up falls only about seventy cars are normally loaded out per shift. Chunks much larger than 1-ft. cubes cannot be readily handled in the car dump employed at the tipple. As a result pieces of much larger size must be broken down. This is done either by hand sledges or by explosives.

In shooting roof the same explosive is employed as for bringing down the coal. For lifting floor 40 per cent dynamite is sometimes used, although here also a permissible will do the work. Sticks 1x6 in. are employed, all firing being done electrically using a low-voltage battery instead of a blasting machine.

For drilling the holes jackhammers are used. These are operated from a portable compressor that is electrically driven from the trolley wire. Steel 8 ft. in length is about the longest that is used with these

machines, so that if a fill is of greater depth than this the rock must be taken down in lifts. However, it is seldom necessary to do this.

Inasmuch as a cut in the bottom can be shot harder and can thus be broken up much more thoroughly than a cut in the roof it represents a much better condition for the machine. The worst condition encountered in machine operation is what might be termed a natural fall or a roof that breaks and comes down of itself. Most such falls can be anticipated and the roof shot before the timbers are crushed. Even this latter procedure, however, results in bringing down the roof in such large pieces that it is sometimes necessary to mud cap and shoot after each two or three cars are loaded. This means much delay.

ROCK IS WASTED OUTSIDE

In these mines practically all the rock that is loaded by power shovel underground is hauled to the outside. Here it is discharged in the same dump as the coal being segregated from it by means of fly valves in the chutes. The rock takes a course through the tipple that is separate from that taken by the coal and after being joined by the slate and refuse picked from the mine product is conveyed by belt to the slate bin. Thence it is taken by slate larries, hauled around a small spur on the hillside and dumped.

Direct savings made by the use of power-operated equipment, even though they may be large, are frequently far outshadowed by and become a secondary consideration when compared with the indirect savings obtained. In the specific case of the power shovel as used at the mines mentioned, although it makes a large saving in the cost of handling rock, yet its chief advantage probably lies in the speed with which its work is accomplished.

At best only two hand shovelers can work to advantage in a 12-ft. heading—any more would be in each other's way. On the average two such men would load out about five cars of rock each, or ten in all during a shift. The shoveling machine on the other hand, operated by a crew of from two to five men, depending upon the condition of the material to be handled, as has been stated, can load an average of about seventy cars per shift. Thus a machine removes roughly seven times the quantity of rock that could be handled by the gang that it supplants. It is this speed of operation that particularly commends its use.

These Portable Conveyors Are Economical for Use on Pillar Work



These conveyors are in the mines of the Phelps Dodge Corp. at Dawson, N. M. They are used exclusively in retreating room stumps and chain pillars. This process saves considerable brushing and relaying of tracks according to W. C. Holman, chief en-

gineer at the Stag Canyon Branch operations of the company. The illustration shows two 20-ft. conveyors in tandem retreating on a chain pillar. The left-hand picture shows the delivery end with coal being deposited in a car.

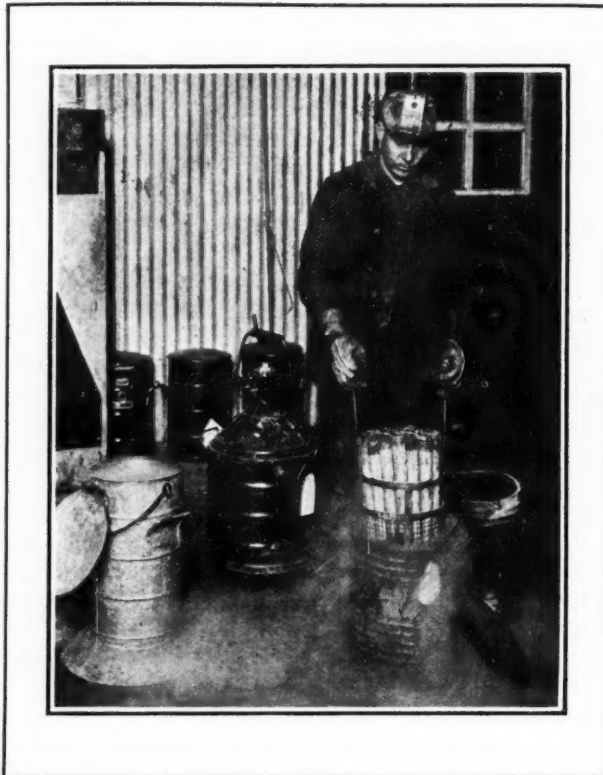
Liquid Oxygen Desirable For Strip-Pit Work

Being Combustible But Not Subject to Detonation Flame or Light Concussions the Cartridges Are Safely Handled

THAT liquid-oxygen cartridges are not suitable explosives for use in coal mines, because of the long flame that results from their detonation and because they are quite readily combustible, is conceded now by everyone. They have, however, been proved advantageous for use in open-pit work including in that designation coal and other strip pits.

During the past few years much has been heard in this country concerning the possibilities of using as an explosive for mining some form of combustible saturated with liquid oxygen. Such an explosive commonly known as L.O.X., has for some years been used in blasting down ore in the iron mines of Lorraine, France. An investigation of this substance, its possibilities and limitations has been conducted by Frederick W. O'Neil, chief engineer of the Ingersoll-Rand Co. and Herman Van Fleet, vice-president of the Air Reduction Co. The following is an abstract of their paper as presented before the winter meeting of the American Institute of Mining and Metallurgical Engineers, Feb. 17, 1926, by Mr. O'Neil.

Reliable apparatus for the production of liquid oxygen has been fully developed and perfected. Operating on the so-called Claude system, which requires compression of the air to only about 900-lb. pressure, liquefaction of the air and fractional distillation with recondensation of its oxygen content, commercially pure



oxygen can be produced at an estimated cost of 2.29c. per pound.

Theoretically the oxidation of pure carbon to carbon dioxide (CO_2) requires 2.67 units of oxygen by weight for each unit of carbon. Similarly, its oxidation to carbon monoxide (CO) requires 1.33 units of oxygen. As commercial carbons are not chemically pure, and as the cartridge wrapper is cellulose and not carbon, it has been assumed that 2.5 times the weight of the cartridge is required for its oxidation to CO_2 and 1.25 times the weight of the cartridge for its oxidation to CO .

Ideal requisites for a cartridge of this kind are as follows: (a) Maximum density in order to provide a maximum of explosive in a given volume. (b) Ability to absorb liquid oxygen in excess of all requirements for complete combustion so as to provide for oxygen evaporation prior to detonation. (c) The physical properties of both the filling material and the wrapper should be such as to render the soaked cartridge mechanically strong in order that it may be handled without breakage. This applies particularly to the wrapper which must not be too brittle at the low temperature of the liquid. (d) The price of the filling material must be low enough for commercial use. (e) The soaked cartridge must be firm and dry. With some filling materials, especially when lightly packed, liquid oxygen readily squeezes out of the cartridges making them difficult to handle.

It should be noted that a material giving maximum requirements of density tends to give minimum capacity for absorption. The commercial cartridge, therefore, will be a compromise between these two requirements.

Approximately 400 varieties of carbon blacks, lampblacks, hydrocarbons and various mixtures were investigated. Many of these materials were rejected in the laboratory because of their high cost, low densities or low absorptive qualities. Several varieties of carbon blacks and lampblacks of satisfactory cost (from 6 to 9c. per lb.) and of satisfactory density and absorption qualities were selected. From this list of possibles



Pouring Liquid Oxygen on Cartridges

This is done at the central charging station. Note the cartridges in a basket, the soaking container on the left and the dry carriers on the right. The cut in the upper corner of the page shows the attendant transferring the soaked cartridges to a dry carrier at the same station.

a lampblack and carbon black were finally chosen as the best absorbents, and further laboratory tests and practical experiments were confined to these materials. Both of these absorbents are procurable in large quantities and at reasonable prices.

Cartridge wrappers must possess the following qualities: (a) The material should be combustible; (b) it should allow liquid oxygen to permeate it readily and (c) it must not be brittle or fragile during soaking, in order that the soaked cartridge may be handled without breakage. It is desirable also that it should retain liquid oxygen while at the same time allowing sufficient evaporation to prevent rupture of the cartridges by expansion of the gas. After experimentation and testing, the material finally selected was a pure rag-stock paper varying in thickness from 0.007 to 0.010 in. Papers which are filled or sized are unsuitable because of their brittleness at the low temperature of soaking.

Considerable difficulty was experienced in making a suitable cartridge. Gumming or gluing the wrapping paper renders it impervious and brittle, and a spirally wrapped ungummed cartridge is liable to sift filling material. A satisfactory cartridge was finally developed, rolled from a piece of paper of rhomboid shape. A machine gums this paper along one edge, so that when rolled into shape this edge circles the cartridge spirally. One end of the cartridge is crimped by this machine and the other is crimped by hand after filling. Both ends are then immersed in paraffin to a depth of about $\frac{1}{4}$ in., thus preventing sifting.

It was soon discovered that hand filling of cartridges was unsuccessful, and a simple machine was developed for this purpose. In this machine a spiral screw acting within the storage hopper causes the filling to exude from a nozzle at its lower extremity. The cartridge is placed on a weighted platform below this nozzle, and the carbon is forced into it against the pressure exerted by the weight. Any desired density of filling may thus be attained. The term density as here used indicates the mean apparent density obtained by dividing the gross weight of the cartridge by its gross volume.

The cost of unsoaked cartridges is about as follows:

7 x 20 in. 8 lb. cartridge, cost per lb. 15 c.	—	cost per cartridge \$1.19
4½ x 18 in. 3 lb. cartridge, cost per lb. 14 c.	—	cost per cartridge .42
1½ x 12 in. ½ lb. cartridge, cost per lb. 24 c.	—	cost per cartridge .04

In the accompanying illustrations Fig. 1 shows the relation between the weight of large cartridges that have been soaked and the time that they have been exposed after absorbing oxygen, and Fig. 2 shows the same relation for small cartridges. Fig. 3 shows the time in minutes taken by cartridges of different densities but of the same composition for the evaporation of excess oxygen down to the quantity necessary for complete combustion to carbon dioxide. This graph would at first indicate that the low-density cartridges are preferable as they give a longer life. As a matter of fact, however, the quantity of carbon present is smaller and their strength per unit of volume is thus decreased. The selection of the proper density, therefore, becomes a compromise between long life (low density) and explosive strength (short life and high density). Cartridges of extremely low density are unable to hold the liquid oxygen and some of it runs out when the cartridge is removed from the soaking bath.

From Europe has come many reports of the excellent results secured from the use of a substance known as

carbene. This is made from acetylene gas and not much difficulty is found in its manufacture. Little hope is seen for the use of this material as an oxygen absorbent because its cost is prohibitive, and the tests already made show it to be inferior to lampblack.

Liquid oxygen may be stored and transported in Dewar flasks or vacuum bottles. These consist essentially of an inner and an outer shell with a vacuum space between them containing a compartment in which is placed a small quantity of activated charcoal. The outer vessel is provided with a lead tube which is connected to an air pump and by this the vacuum space is exhausted. When the required degree of vacuum has been obtained this pipe is pinched off and the end soldered over. At the low temperature existing in the flask when filled with oxygen the activated charcoal absorbs the residual air in the vacuum space. The whole flask is then surrounded by a sheet-steel case, the space between it and the outer container being filled with excelsior or similar material. Such flasks have shown themselves to be highly efficient in the shipment of liquid oxygen by combined railroad and motor-truck transportation, the entire journey taking three or four days. The average loss in transit from eighty 15-liter containers amounted to 10 per cent per 24-hr. day. At rest these same flasks had a loss from evaporation of 7.6 per cent per 24-hr. day.

It is believed entirely feasible in liquid-oxygen plants to store the oxygen in double receivers large enough to hold a 24- to 28-hr. supply. Although no data are available concerning the evaporation that would take place from vessels of this capacity, it is believed that owing to the large ratio between the volume and radiating surface as compared with small flasks, vacuum insulation would probably be unnecessary and hair felt or mineral wool could be used instead. Such receivers should, however, be made of copper or of a copper alloy; steel is unsuited to this purpose because it is liable to develop fine cracks at the low temperatures encountered.

Experience concerning the maintenance of vacuum equipment has not extended over a period sufficiently long to give satisfactory data. Out of 55 such containers fifteen had to be re-evacuated at the end of one year. Loss of efficiency in containers of this kind arises less from a loss of vacuum than from the fact that the inner and outer shells come into contact from rough handling. The re-evacuation of vessels of this kind is not difficult and can be readily performed at the mine.

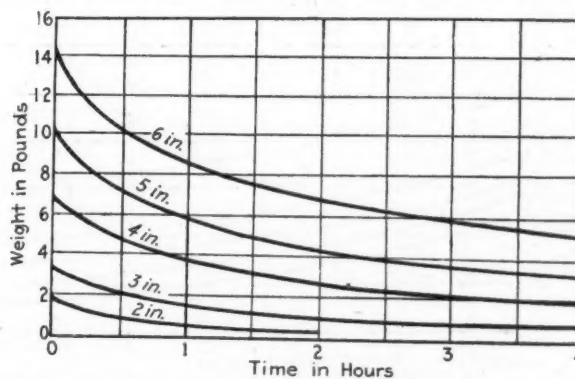


Fig. 1—Typical Time-Evaporation Curves for 12-in. Cartridge of Large Diameter

The cartridges of 6-in. diameter after two hours have less than half and after four hours about one-third of their original charge still left. The carbon is in a cotton bag. The exposure is made to the open air.

A suitable vacuum gage and a small 2-stage oil-immersed vacuum pump are all the equipment required.

Cartridges are soaked in straight-sided Dewar flasks. These are built on the same constructional principles as the transportation containers. In order to facilitate handling, the cartridges are placed in copper-wire baskets which fit easily within the container. Before starting to use a flask of this kind a small quantity of oxygen should be placed in it so that it may become chilled before the soaking of cartridges begins. In containers of this kind hair-felt insulation gives almost as good results as a vacuum.

In soaking, the cartridges are placed in a copper-wire basket which is lowered into the soaking container after which the oxygen is poured in. Fig. 4 shows the results of tests, setting forth the time required to soak cartridges of various diameters. It will be noted that when a cartridge sinks it is practically saturated and that the time required for complete saturation is from 15 to 18 min. A 5-in. cartridge requires about 30 min. for complete saturation.

Because vacuum soaking containers are rather awkward to handle and liable to damage, and inasmuch as hair-felt insulation has practically the same efficiency, what is termed a dry carrier has been developed. This consists of a double-wall vessel with about 1½ in. of hair-felt insulation between the walls, the inner vessel being made of copper and the outer one of steel. After the soaked cartridges have been removed in their basket from the soaking container, they are placed in a dry carrier into the bottom of which a little liquid oxygen has been poured. The cartridges then tend to remain saturated through capillarity from the oxygen in the bottom of this carrying vessel. Tests to determine the ability of the cartridge to take up liquid oxygen by capillarity are set forth in Fig. 5, which gives the effect of standing a dry unsoaked cartridge on end in one of these dry carriers in which a little liquid oxygen has been placed, this liquid being maintained at a constant level. This test shows that the dry cartridge is able by capillarity alone to absorb enough oxygen to reach a point between its carbon-monoxide and carbon-dioxide requirements.

Fig. 6 shows the evaporation that takes place when soaked cartridges are placed in a dry carrier with a little liquid in the bottom. This sets forth conclusively that it is entirely practicable to keep cartridges in this way 1½ hr. after soaking before use. The results shown were obtained with cartridges of rather low density and with the carrier only two-thirds full. With cartridges

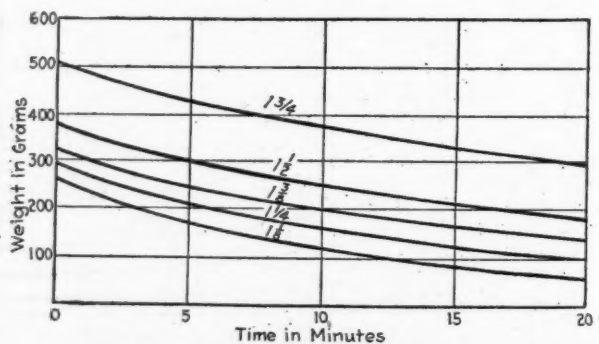


Fig. 2—Typical Time-Evaporation Curves for 10-in. Cartridges

Curves show that the weight of the liquid oxygen decreases rapidly in the cartridges as time passes. The carbon is held in a paper wrapper, and the cartridges are exposed in the open air after soaking. Note this graph has a different time scale from that of Fig. 1.

of higher density, such as are usually employed and with the carrier well filled, the loss of oxygen would be reduced about one-half. The vacuum soaking container thus need not be carried into the working places, but the cartridges may be prepared at a convenient central point. This permits a large saving in labor and trans-

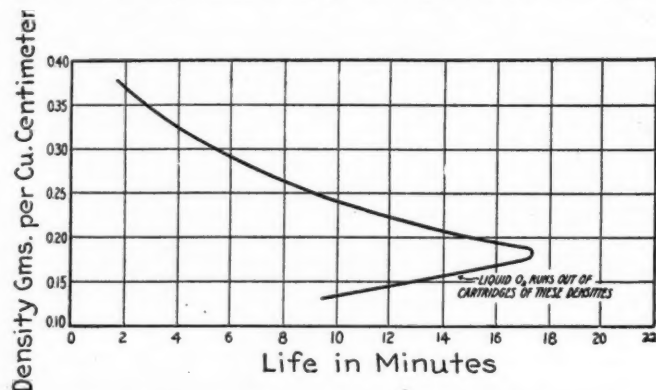


Fig. 3—How Cartridge Life Varies with Density

Dense cartridges hold but little liquid oxygen and have a short life. Loose cartridges take up a lot of oxygen but leak badly when they are no longer immersed and so they are undesirable. A happy mean is to be preferred.

portation as well as a reduction in wear and tear on the vacuum equipment. It also allows the use of larger containers and makes possible the saving of a large quantity of oxygen which would otherwise be lost.

The strength of any explosive is a function of the total energy it develops and the rate at which this energy is liberated. The methods most commonly used for determining the total energy are the ballistic pendulum and the Bichel gage. Many tests carried out in the explosives laboratory of the Bureau of Mines at Pittsburgh indicate that carbon is the best absorbent for liquid oxygen of all the materials tested and when properly soaked is practically equivalent to 40 per cent dynamite.

In the Bichel gage, or closed bomb, various cartridges were tested. As the insertion of the cartridge, closing of the bomb and getting ready for firing requires about 10 min., the soaked cartridges cannot be fired in this device at the theoretically correct time. The conclusion could be drawn from these experiments, however, that carbon L.O.X. cartridges are superior to those made from other substances volume for volume.

Comparisons with rate of detonation of trinitrotoluol cordeau by the Dautriche method showed that the rate of detonation of L.O.X. cartridges when fired at the CO₂ point, ranged from 5,520 meters (18,100 ft.) to 5,950 meters (19,400 ft.) per second. This rate varies somewhat with the length of time that the cartridges have been removed from contact with the liquid oxygen before firing. The longer the cartridges are exposed to the air the slower their rate of detonation. With 1½x8-in. carbon cartridges this rate of detonation changed from approximately 4,850 meters (15,900 ft.) per second at 5-min. exposure to the air to 4,150 meters (13,600 ft.) per second after an exposure of 30 minutes.

Tests were also made on the continuity of detonation. For this purpose a string of 1½x12-in. cartridges 40 ft. long, was laid with the cartridges end to end and in contact. This was detonated by a cap in the end cartridge. All cartridges in this string detonated uniformly. Cartridges of the same size were then laid on the ground end to end with an air gap between adjacent cartridges. It was found that straight carbon car-

tridges would detonate in this way across an air gap of from 5 to 7 in. By the addition of suitable hydrocarbons, or metallic powders, the gap across which they could be made to detonate could be increased to 20 in. or more. Tests conducted on 1½x12-in. cartridges in a drillhole, placing one cartridge in the bottom and detonating another at the collar, demonstrated that the bottom cartridge can be detonated across a gap of 3½ ft. or more. Evidently no difficulty will be experienced in mining because of failure of the cartridges to touch each other in the hole.

It was found impossible to detonate any of the carbon L.O.X. cartridges in the open air by flame alone, that is, by a fuse inserted in the cartridge. Caps in this case were necessary in order to assure detonation. When confined in a drill hole, however, the cartridges can be detonated by a fuse without cap, this being the standard practice in the iron mines of Lorraine. The tests on different strengths of detonators showed that they all had a like effect upon this explosive and that one strength of cap was as effective as another.

Tests were also conducted to determine how small the quantity of oxygen in the cartridge could be and still secure detonation. Cartridges were exploded that contained only 3.3 per cent of the oxygen necessary for their combustion to carbon dioxide. As the oxygen evaporates from one of these cartridges there is a tendency to leave a saturated core in its center, and detonation can be obtained as long as this core is present provided the cap is in contact with it. A 4-in. cartridge was detonated after the lapse of four hours in the open air.

Sensitiveness of the new explosive to impact was also tested. In the large impact testing machine at the Bureau of Mines laboratory the explosive was placed between steel disks and a weight of approximately 440 lb. dropped on it from varying heights. The explosive can be fired in this manner without difficulty. Many attempts have been made to detonate it by throwing cartridges against rock faces in stopes at distances of from 60 to 80 ft. In every case the cartridge failed to detonate. Dropping a miner's acetylene lamp that had previously been lighted into a container full of prepared cartridges was also tried. The cartridges did not detonate but were set on fire, producing a large flame of intense heat. A high-power rifle bullet fired through the container detonated its contents.

Tests made in the friction-testing machine in the Bureau of Mines laboratory showed that L.O.X. would not detonate under either the fiber or steel shoe. These and numerous other experiments have demonstrated

that with the smaller cartridges having densities of approximately 0.3, fired within 10 to 12 min. after soaking, L.O.X. is equivalent to 40-per cent dynamite, volume for volume. For the larger cartridges, the same holds true for firing at 30 to 45 min. These firing

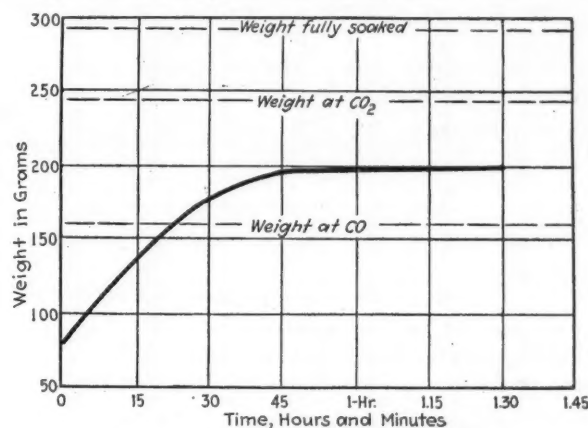


Fig. 5—Capillarity Test, 1½x12-in. Cartridge

The dry cartridge is set on end in 1-in. of liquid, the liquid being maintained at constant depth. The dry weight of the carbon cartridge is 69 g.

periods are based upon the loss of oxygen taking place in the open air and are extended considerably when the cartridges are confined in a drill hole. This extension in the smaller diameter of cartridges ranges from 15 to 20 per cent.

One of the chief disadvantages in the use of L.O.X. in highly abrasive rock lies in the fact that the gage of the drill is appreciably decreased during the drilling process with the result that the holes are tapering. Inasmuch as the cartridges are practically solid they will not deform and fill the hole perfectly in loading. Their effectiveness in breaking rock is thus somewhat decreased.

In practical operation electric firing was found to be effective but under the conditions where the explosive was tried better results were obtained by shooting with fuse. This was crimped into an ordinary cap which was placed within a brass tube, into the other end of which a piece of ordinary cordeau was inserted. The brass sleeve protected the detonator during loading, and the cordeau acted somewhat as a booster.

All practical tests with these explosives tend to verify the work done in the laboratory and the conclusions drawn therefrom. In the light of the work done at Mineville, the following conclusions may be drawn so far as underground mining is concerned— (1) Where the ground is heavy and abrasive, causing the drillholes to be considerably tapered, L.O.X. costs more than dynamite. (2) Where the method of mining involves drilling of comparatively shallow holes without a large loss of gage, this explosive may be commercially profitable, especially where the price of dynamite is high. (3) The use of L.O.X. does away with the necessity of maintaining a stock of explosives at the mine and renders the powder supply independent of interruptions in transportation. (4) It has been shown that there is no danger from the premature detonation of this new explosive. There is, however, a danger of premature ignition resulting in violent long-flame conflagration, which would be dangerous in confined spaces underground. In loading holes, there is some danger of the liberated gas blowing out the stemming, and, perhaps, of ignition of carbon-laden gas by miners' lamps. The danger of drilling into missed holes is

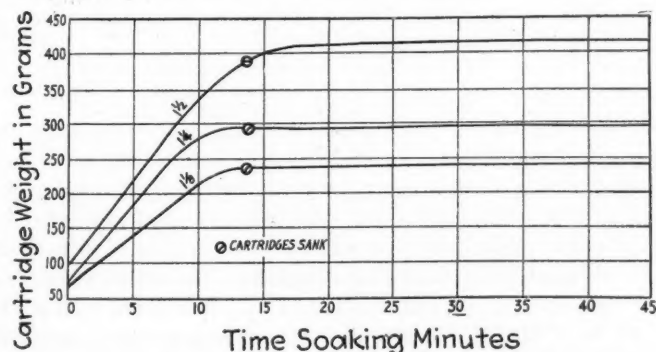


Fig. 4—Time Required to Soak Carbon Cartridges Beginning with Pouring

Note that the large cartridge is soaked almost as rapidly as the smaller cartridges. After sinking the latter gain little, if any, weight, but the large cartridge makes a slight absorption.

eliminated, and upon this score the new explosive is safer than dynamite. (5) The use of the new explosive for shooting down coal is not recommended because of its long hot flame. (6) When firing must be done simultaneously in a large number of adjacent places, it is much more difficult to synchronize this work if L.O.X. is used than if dynamite is employed. (7) More holes are lost with L.O.X. than with dynamite because the fuse is not held as firmly. Also, inasmuch as the cartridges fit the hole loosely, they are sometimes jarred out by the detonation of adjacent holes. If a cartridge jams in loading, because of the hole being crooked, there is no time to remedy it, and there is usually no time to reload a hole that blows out its stemming by evolved gas.

While operations were going on at Mineville, oxygen was shipped to various quarries and such highly satisfactory results obtained that the liquid-oxygen plant was moved to Lebanon, Pa. From this point many quarries and open-pit operations could be reached. Tests were then made in a wide variety of rocks. These trials were mostly conducted in 6-in. holes, there being a few 2-, 4- and one 8-in. hole. The depths to which these holes were drilled varied from 6 to 106 ft., and the number of holes fired simultaneously ranged from 1 to 40. From the plant at Lebanon oxygen was shipped over long distances sometimes being held in the transportation container as long as 96 hr. For this purpose containers of 50-liter capacity, with a loss of about 3 per cent in weight per 24-hr. at rest, were employed. The loss was about twice this quantity when the containers were agitated during travel.

Most of the cartridges used in this work measured $4\frac{1}{2} \times 18$ in. and a few were 7×24 in. These were made of the straight carbon black but were incased in cylindrical cotton bags, instead of in paper, as the large paper containers were found to be too fragile to withstand handling. Because of the large size of the cartridges and the necessity for soaking a great number at a time, large soaking tanks were developed. These were merely copper-lined boxes insulated with hair felt.

A continuous length of cordeau from the bottom to the top of the hole was used in these large blasts. This was first placed in the hole and all the cordeau from the various holes were spliced to a common trunk line which was detonated electrically by a single cap.

In introducing the cartridges into the hole a flared copper funnel, about 6 ft. long was used. This both guided the cartridges and kept surface material from falling into the hole. The stemming used was generally loose earth merely shoveled into the hole without tamp-

ing. As a rule each hole was filled to the collar. In no instance was the stemming blown out. Neither was difficulty experienced in loading wet holes, and some were fired that were filled with water to the collar. In forty-nine blasts of this kind only four encountered difficulty, and investigation of these disclosed the fact that they were not charged or fired properly due either to miscalculation or to inadequate facilities at the time of charging the hole. With these exceptions all the shots were successful in every respect.

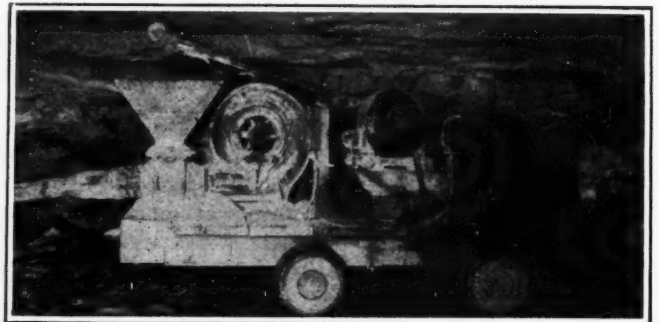
From the total quantity of dynamite replaced, as well as from the quantity of oxygen and dry cartridges used in all of these blasts, it would appear that 1 lb. of dynamite could be replaced by 0.935 lb. of oxygen, measured as produced at the liquid-oxygen plant. This, therefore, includes all losses of every sort. It also appears that 0.201 lb. of dry cartridge are required to replace 1 lb. of dynamite.

As to cost, to replace 1 lb. of dynamite for this class of service, 0.935 lb. of oxygen is required at 2.29c. per lb., making a cost of 2.14c., also 0.201 lb. of cartridge at 14c. per pound, or 2.83c. This makes a total cost of 4.94c. to replace 1 lb. of dynamite.

Rock-Dusting Gains Slowly In Alabama Coal Mines

Eleven Companies Now Dust Fifteen Mines—
Powdered Dolomite is Used Exclusively—Most
Machines For Applying It Are Home-Made

DURING the past calendar year rock-dusting did little better than hold its own in the coal mines of Alabama. It was inaugurated at a number of mines in 1924 awakening wide interest throughout the state but gathered only two converts in 1925. The Woodward



This One Is Electric

Rock-dusting machine used at Sayre mine of the Gulf States Steel Co. The motor at the right does the propelling. Push-Button control makes the machine simple and safe to operate. When not engaged in emptying bags of dust into the hopper the operator sits on the platform beside the hopper and directs the flexible leather nozzle.

Iron Co., which has been recognized as a leader in safety measures has not yet seen fit to slacken its intensive water sprinkling program in favor of rock dust.

The present status of dusting in the state is as follows: Approximately 1,700 tons of rock dust has been applied by eleven companies in fifteen mines. Practically all of the dust used was powdered dolomite. At least six of the eleven companies are using dusting machines of their own design and manufacture. Some are scattering the dust by hand. Few dust barriers have been installed.

The Gulf States Steel Co. and the Galloway Coal Co.

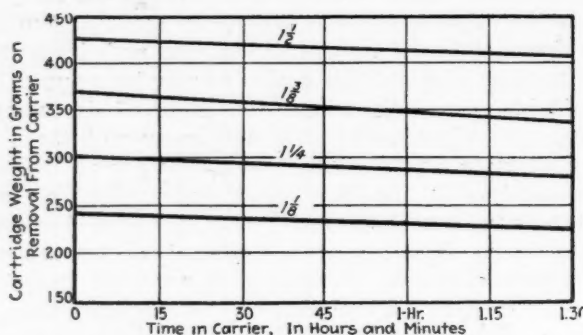


Fig. 6—Oxygen Loss in Dry Carrier

Here the fall in the oxygen content is much slower, of course, than in open air. Compare this with Figs. 1 and 2 where the evaporation is unhindered. Note also the difference in the time scales. The cartridges are stable enough that they can be made in a central loading station.

were the pioneers in Alabama rock-dusting. The former company has dusted 64,450 ft. of gob entry in the Sayre mine using 208,200 lb. of rock dust or 3.23 lb. per linear foot of entry. Early in 1925 the Galloway company completed the dusting of its No. 11 and No. 15 mines but has not included any of its other mines in the program.

The self-propelling distributing machine used at the Sayre mine is shown in one of the illustrations. On this machine, which was designed and built at the company shop, a separate motor is provided for propelling and both motors are controlled by fully-enclosed automatic starters. It takes but one man to operate the machine.

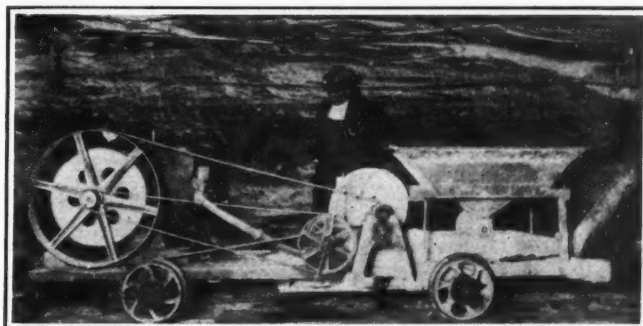
The rock dust in 50-lb. bags is carried in a mine car attached to, and pushed ahead of, the duster. Without stopping the machine, the operator empties the 50-lb. bags into the hopper, and between times sits beside the hopper and directs the leather nozzle as the character and shape of the entry demands.

In September, 1924, rock-dusting was started in the mine of the New Castle Coal Co., at New Castle, Ala. At that time two miles of entry were dusted. This territory was given a second dusting in March, 1925, and a third application in October of the same year when the work was extended to the face, making a total of somewhat over five miles of dusted entry. Samples taken just prior to the October application showed the combustible to be still above the assumed safety limit of 60 per cent.

In this mine 4 lb. of rock dust per linear foot of gobbed entry was applied at the first dusting. In the second and third applications 2 lb. per linear foot was used.

The gasoline-driven machine used at New Castle is shown in another illustration. A mule is used to pull the machine and dust car. The dust is handled in 100-lb. bags and the machine hopper holds 500 lb. The 16-in. blower is driven by a 2½-hp. engine. Feeding of the dust into the blower discharge pipe is accomplished by a rotating cylinder 4 in. in diameter and 8 in. long. This cylinder contains four measuring pockets and its drive shaft is fitted with cone pulleys providing for three speeds.

The powdered dolomite used in Alabama mines is all fine enough to pass through a 40-mesh screen, and



A Gas Engine Drives It

This duster is used at New Castle. M. G. Launius, superintendent, is standing back of the machine. It is not self-propelling. A mule furnishes the tractive power for the machine and a dust car. The blower and feeder are driven by a 2½-hp. engine.

60 to 70 per cent is of 200-mesh. The price, f.o.b. the mill in bulk, is \$3 per net ton. In 100-lb. bags the price is \$4.75 per ton, with a rebate of \$1.50 for the return of all of the bags in good condition. If put up in 50-lb. bags the price is \$6.50 per ton with possible rebate of \$3.

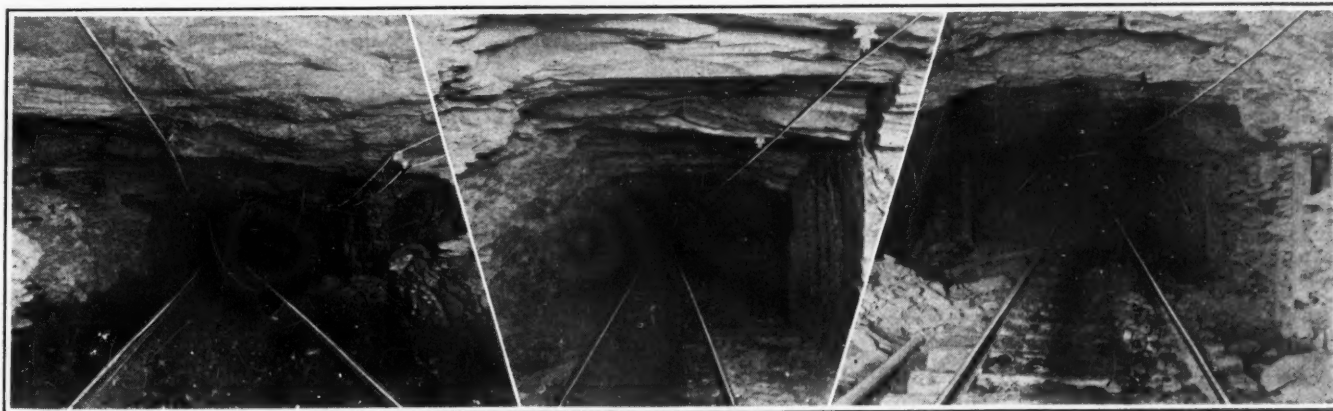
The cost of applying the dust varies widely. A fairly representative figure is that of a company which reports that its labor cost is \$5.11 per ton of dust applied. The labor and material cost is \$1.63 per linear foot of entry. This company uses a self-propelling machine which requires but one operator.

The future development of rock-dusting in Alabama will no doubt depend somewhat upon the action of leading companies such as the Tennessee Coal, Iron & Railroad Co., and the Woodward Iron Co. The Alabama Fuel & Iron Co., one of the large producers, recently decided to rock-dust all of its gassy mines and has bought a dusting machine and two carloads of dust with which to start.

Contrary to the usual order, rock-dusting in Alabama was not started by the larger companies but instead by the medium-tonnage producers. It is now spreading slowly but surely to include companies of all sizes.

COAL AGE INDEX

THE INDEXES to *COAL AGE* are furnished free to all who ask for them. The index for the last half of 1925 is now ready for distribution. A copy can be had by addressing a postcard to the subscription department of *COAL AGE*.



These Entries Are Dusted According to Alabama Practice

At the left is a view down the 14th straight in Sayre mine. Here roof and ribs are rock-dusted. The bottom is kept wet by daily sprinkling. Spillage of fine coal from end-gate cars is considerable. Frequent rock-dusting would be required if an effort were made to keep the combustible matter in the roadway dust down to the safety limit of 40 per cent. In the center is the rock-dusted main slope of the New Castle mine. Two miles of entry

was dusted in September, 1924, when the practice was adopted. At the third dusting, in October, 1925, the work was carried to the face. About five miles of entry in the mine is now dusted. At the right is the second straight cross off the 14th left in Sayre mine. This entry was dusted for the third time about a month before the picture was taken. Rock-dusting with the light colored dust used in Alabama relieves a mine of much of its gloom.

Viewpoints of Our Readers

Why Tuberculosis Rate Is Low in Missouri Mines

In the editorial on p. 150 of the Jan. 28 issue of *Coal Age*, the tuberculosis rates in the northern part of the state of Illinois are shown to be higher than in the state of Missouri though there is much rock brushing and bottom lifting in both of these low coal areas and the question is asked: "What gives the Missouri miner his low tuberculosis rate?" This question appears as a comparison with the northern Illinois condition. I believe the reasons to be as follows:

The Missouri coal mines are moist and there is a minimum of dust of either rock or coal in suspension.

The northern Illinois coal mines are dry to a much greater degree than the mines of Missouri, with the consequent increase in the quantity of rock and coal dust found suspended in the air of the mines.

You will probably remember that whereas Missouri has in the past been quite a coal-producing state, its record for explosions in the last twenty years has been low.

A. W. DICKINSON.

Rock Springs, Wyo.

Shooting More Important Than Shearing

Mr. Levin's article, in your Dec. 31 issue, on a new shearing machine again brings up the perennial question of center shearing as an aid in producing more lump coal.

At the 1924 summer meeting of the Rocky Mountain Coal Mining Institute I presented a paper on this subject (subsequently reproduced in *Coal Age*) in which was set forth the results of a number of tests made in Clear Creek Mines of the Utah Fuel Co., all of which indicated that shearing was not advantageous.

Up to that time my experience in cutting and shooting had covered only the usual blocky type coals; recently, however, a case where the coal was decidedly laminated came under my observation, and it seemed that shearing would be a great aid in securing more lump and in preventing over-shooting. No opportunity was afforded to try machine shearing, but some tests with the

pick confirmed the view that shearing would result in considerable economies.

In the article referred to I pointed out certain inherent difficulties in shearing, among which was the relative instability of the cutter bar when putting in a vertical cut. The kerf in shearing is apt to overrun the expected width enough to upset all calculations as to the amount of slack to be produced. I was never able to reduce the percentage of slack by shearing. I was able to produce somewhat larger and better lump, but never to an extent that would make the process economical.

Mr. Levin also states that it is questionable if snubbing the face will yield results comparable with center shearing in increasing the percentage and grade of the lump. This is a surprising statement, though it probably will hold good in the rather rare cases of highly laminated coals. In the case of blocky coals, however, snubbing with proper depth of undercut and properly controlled shooting is by long odds the most promising method.

LONGER BARS NEEDED

In the matter of cutting practices, too, much dependence has been placed on the machinery builders and not enough on the technical staff of the mines. The determination of the proper length of cutter bar for a given mine is seldom given much attention, and often the changing of the length of the bar makes a surprising difference in the amount and grade of the lump. There is one certain length of bar for each seam or mine that will give maximum results. I am convinced that longer bars than are now customary will prove feasible and economical in most cases.

The crucial point in all programs for improved mining is blasting. In most districts the rule-of-thumb methods of practical miners prevail, in others overworked pit bosses and powder salesmen conspire to "improve the shooting," often with quite good results. The old theory of the independent miner furnishing his own supplies and being responsible for every detail of his "place" still hangs like a millstone around our necks, hampering progress at every

turn. I know of one instance where the profit on the sale of powder to the miners through the company store prevented the adoption of a shooting system that promised large economies.

Wholly aside from its safety aspects, shooting looms large in any economic study of detailed mining expenses. That it, along with dozens of other serious matters, is concealed in a "contract mining rate" by no means minimizes its importance. In fact the big job just now is to segregate this contract mining rate into its detailed elements, study each one as we study hoisting or greasing pit cars, and apply the knowledge thus gained in reducing costs.

When we get down to brass tacks and apply scientific studies and methods to our blasting practices there will be less demand for additional "loose ends" to shoot to, and the extra machinery, power and labor necessary to produce them.

THOMAS A. STROUP.

Quincy, Ill.

Coal Truck Aids Oil Tank

We have just had a very unique experience with our unfriendly competitor, oil. Our Park Ridge yard had a hurry call from a man who used to be one of our customers, but this fall put in oil. Our ex-customer asked us to loan him a heavy tow-chain, as a big oil truck from Hackensack which was delivering oil fuel to his house was stuck about a mile from him. With a sincere desire to help him out, we sent the chain and our driver to see what could be done to assist, but the latter returned about half an hour later reporting that the oil truck was stuck so deep in the snow that he did not think it would get out that night.

It looks as though our customer will be in bad, and perhaps run the danger of freezing up the plumbing in his house.

This is just another one of the oil-burner hazards that people do not usually think about at the time of oil burner installations. Although this customer's oil burner is a very high-priced affair, and supposed to be one of the best that's made, it is no better to him than any other on the market at a particular crisis like the above, and he might rather and much more safely have stuck to good old coal, the safe and standard fuel.

H. B. BLAUVELT.

Hackensack, N. J.

Book Reviews

Distress Follows Ruhr and Lorraine Separation

With civilized peoples, progress, comfort and wealth depend on the mineral resources of the soil as much probably as on the intelligence of the population. The Ruhr and Lorraine districts with their respective wealth of coal and iron will accordingly have much to do with the good fortune of the German and French nations by which they are owned. Coal is relatively useless without iron. No modern population can progress without the latter, and if it be not available, the coal is of but little industrial value. Today, owing to the war, the line between Germany and France is roughly that of the line separately the coal of the Ruhr from the iron of the Lorraine district. Unless, then the two can be brought together the deposits are of little value to either nation. The bitterness engendered by the war, therefore, acts to the detriment of both regions, creating a difficult international situation. This is the theme of the fifth volume of the series of books being prepared by the Institute of Economics on the problems of international industrial reconstruction.

Guy Greer, the author, appears to be an unbiased witness of the embarrassment caused by the divorce of the two regions, and in this book of 328 pages measuring 5x7½ in. he speculates on the effects that may be expected to follow. The title of the book is "The Ruhr-Lorraine Industrial Problem." The publisher is the Macmillan Co., 60 Fifth Ave., New York City, and the price, \$2.50.

The World's Rival Fuels and How They Are Handled

A mine of information is the book on "Fuels and Their Combustion," by Robert T. Haslam and Robert P. Russell, professor and assistant professor of chemical engineering, respectively, at the Massachusetts Institute of Technology. Every part of the subject of fuels is covered, from their formation in the geologic ages, their composition and distribution, to their uses, whether burned in the raw state or converted into pow-

der form, gas or into one of the many other forms by the carbonization process.

One is surprised to note, however, that low-temperature distillation is so casually treated. The Piron-Caracristi process is briefly described, as also the Greene-Laucks and Economic Carbonization processes, but the McEwen-Runge, McIntyre and amalgam processes are conspicuously absent. Something is said about Carbo-coal also, though the equipment and methods are not described. American low-temperature distillation methods in fact are given a scant page and a half—and indeed, Europe is treated to about an equal space. It should be said, however, that the general principles of low-temperature carbonization are well described.

ALL THE FUELS FOUND AND MADE

The book, which contains 809 pages, measuring 6x9 in., commences with a review of the fuel situation, then discusses the origin and composition of coal, the types of coal and their classification, spontaneous combustion and storage, coal resources and coal production, petroleum, other primary fuels, the chemistry of combustion reactions, combustion of elementary fuels, combustion calculations and the properties and combustion of gaseous fuels. So much for theory. This is followed by combustion of coal on grates, the operation of hand-fired furnaces, mechanical stokers and furnaces, powdered coal, the combustion of fuel oil, furnace efficiency and heat losses, producer gas, water gas and oil gas, and the carbonization of coal. At the end of the book are three lengthy appendices, one on the flow of liquids and gases, another on the flow of heat and a third on the rate of heating.

LOSSES IN FUEL USE

The book will be found a valuable addition to any engineer's library and especially to a coal man who is interested in the uses to which his coal is being put or may be put in the future. The book is published by the McGraw-Hill Book Co. and sells for \$7.50.

In discussing the fuel situation it shows a chart credited to George Otis Smith, exhibiting how with

waste—in mining, in transit and in combustion—15,700 lb. of coal may be used up to produce 1,000 hp.-hr., whereas with up-to-date conditions in all three parts of the operation 1,320 lb. would serve the purpose, the combustion and plant losses in the one case requiring 10,000 lb. and in the other only 1,200. Fortunately for the industry, no small portion of these economies already has been effected at most large plants.

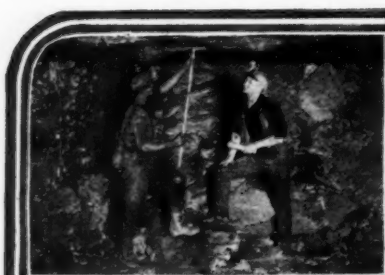
The reviewer is influenced overmuch by a personal interest in pyrite, and may be excused for taking exception to the author's declaration that "The pyrites is mainly formed by the intrusion of rock." The rock is not intruded, and Thiessen's view, long advocated editorially by *Coal Age*, that in almost all plants there is sulphur enough to account for the sulphur in the coal would seem warrant for believing that the pyrites in coal is no extraneous material. It should be said, however, that after this strange and inexplicable remark the author quotes Thiessen as testifying to the presence of sulphur in the proteins entering into the coal mass, which "on putrefaction yield hydrogen sulphide which would precipitate the heavy metal sulphides."

R. DAWSON HALL.

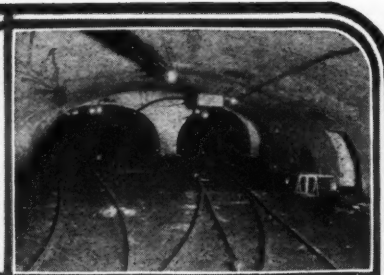
Progression in Chemical Analysis

Analytical methods are receiving revision for purposes of attaining greater accuracy in the case of bodies the ultimate analysis of which we are seeking and to obtain more uniform results in the case of materials regarding which we desire only a proximate analysis. Hence a revision and fourth edition of Wilfred W. Scott's book on "Standard Methods of Chemical Analysis" will be welcomed. To the first volume twenty-seven and to the second twenty-six specialists contribute, so the work is not a one-man book but a well-ordered symposium of specialists.

Volume 1 deals with the elements and Volume 2 with materials such as paints, fats, waxes, oils, alloys, cement, gas, asphalts, tars, pitches, carbon steel, explosives, water, rubber, soap, slag and so forth. Coal is given 18 pp. and methods for analysis of fuels, 29. The actual text in the two volumes which are of equal size occupies 1,805 pages each 6x9 in. The books are published by D. Van Nostrand Co., 8 Warren St., New York City, the price being \$12 for the two volumes.



Underground Operation



How Track Grades Govern Locomotive Capacity

Resistance to haulage arising from grades, says James L. Libby in the *Employees' Magazine* of the Union Pacific Coal Co., is always 20 lb. per ton for each per cent of inclination, 1 per cent of 2,000 lb. being 20 lb. The track resistance for cars equipped with plain-bearing wheels is about 30 lb. per ton on level track, whereas those equipped with roller bearings have a resistance of about 20 lb. per ton. Most mine cars weigh approximately three times as much loaded as they do empty, and on this basis the most efficient grade is $\frac{1}{3}$ per cent in favor of the loads for trips with plain-bearing wheels and $\frac{1}{4}$ per cent for those with roller-bearing wheels.

ANGLE OF CAR REPOSE

The angle of repose, or that grade on which cars are on the verge of movement by gravity and on which if moving they will not accelerate in speed, is 1.5 per cent for plain-bearing and 1 per cent for roller-bearing wheels. These grades are ideal for gravity switches when cars are well oiled, in proper repair and the tracks are kept clean, but if the cars are kicked in, a lighter grade is preferable. Starting friction is about 60 lb. per ton for plain-bearing and 35 lb. for roller-bearing wheels.

The rated drawbar pull of a locomotive depends upon the weight on the drivers. With cast-iron wheels this pull is $\frac{1}{2}$ of the weight, or 400 lb. per ton, whereas with steel-tired wheels it is $\frac{1}{3}$ the weight, or 500 lb.

On grades a locomotive cannot develop its rated drawbar pull because of the loss of effort or the power required to raise the machine itself up the grade, and thus 20 lb. per ton of locomotive weight must be subtracted, amounting to 5 per cent of the load for cast-iron wheels and 4 per cent for steel wheels.

Put in a simple way, using rolling friction at 30 lb. per ton for the load hauled and taking the drawbar pull

at $\frac{1}{3}$ the weight, a locomotive will haul 13.3 times its own weight in tons on a level track, whereas on grades it will show the following results: Up a 1 per cent grade it will haul 7.6 times its own weight; up a 2 per cent grade 5.1 times its weight; up a 3 per cent grade 3.8 times its weight; up a 4 per cent grade 2.9 times its weight; up a 5 per cent grade it will haul 2.3 times its weight. Down a 1 per cent grade it will haul 42 times its weight; down a $\frac{1}{2}$ per cent grade 20.5 times its weight, and down a $\frac{1}{4}$ per cent grade it will haul 14.4 times its weight. A close approximation to the haulage capacity, in tons, of a motor working on a grade, as compared to the weight of the machine, may be found by the following rule, which is as nearly correct as the theoretical values, when condition of the track is taken into consideration.

Fifteen divided by the numerical per cent of adverse grade plus one, equals the number of times its own weight that a locomotive will haul up a given grade. Thus, for a one per cent grade we have: Load hauled = $15 \div (1 + 1) = 7\frac{1}{2}$ times locomotive weight.

Up a 2 per cent grade we have $15 \div (2 + 1) = 5$ times weight of locomotive.
Up a 3 per cent grade $15 \div (3 + 1) = 3\frac{3}{4}$ times weight of locomotive.
Up a 4 per cent grade $15 \div (4 + 1) = 3$ times the weight of the locomotive.
Up a 5 per cent grade $15 \div (5 + 1) = 2\frac{1}{2}$ times the weight of the locomotive.

Inasmuch as a locomotive will haul 13.3 times its weight on a level track, 50 per cent additional on a downgrade of $\frac{1}{2}$ per cent and 200 per cent in excess of a level haul on a 1 per cent grade, the necessity for the proper grading of main haulage-ways is apparent.

Did Powhatan Blast Start In Mine or Tipple?

In the explosion which took place on Feb. 15 in the mine of the Powhatan Mining Co., Powhatan, Ohio, killing one man and burning twenty-two others, several seriously, coal dust played a major role. The explosion spent its greatest force in

the shaft bottom and hoisting shaft, from which it extended to the tippie, ripping off much of the sheathing from this structure without damaging the equipment to any extent. This mine was rock dusted—to what extent has not been ascertained—and open lights were used. The coal is emptied from the mine cars by a rotary dump on the bottom and hoisted by skips.

Chief Inspector Jerome Watson, of the Ohio Department of Mines, in an interview with the *Wheeling Daily News*, as reported in the issue of Feb. 16 of that paper said:

"The findings seem to indicate that a short circuit in the tippie set off the blast which swept down the shaft. Everything in the shaft and entry indicate that the trend of the force was downward. Had the explosion come up unquestionably more damage would have been done to the tippie.

OPEN-AIR EXPLOSION

"The small damage to the tippie was the result of an open explosion. Had the dust been more closely confined there the force would have been as great as in the mine and a complete wreck would have been the result. This is another point in favor of the theory that the blast started there and went down, thus leaving the tippie before serious damage was done.

"When the blast reached the bottom of the shaft it was at its height and wrecked the weighroom and burned the men who were within the area it swept over. After passing down the entry a short distance the blast encountered rock dust and moisture. Both these elements tended to weaken the force and it spent itself after running a few hundred feet."

Some have wondered why, after examining the mine following the explosion, Mr. Watson chose to fix the location of the source of ignition in the tippie rather than in the shaft bottom, in the absence of unquestionable evidence backing his belief.

Several years ago the U. S. Bureau of Mines conducted a series of tests at its experimental mine at Bruceton, Pa., in an attempt to propagate an explosion of coal dust inby from a point 150 to 200 ft. from the mouth of the drift by means of a blownout shot. While the blownout shot in these tests in some cases ignited the coal dust outby of the point of ignition, in no instance did propagation extend inby. In view of this fact it is held by some that it is unreasonable to suppose that an explosion of dust in the open, where no propelling pressure might be built up, would extend down the shaft and propagate itself for several hundred feet along the shaft bottom.

Safety Kits Save Lives At Overton Disaster

In the explosion which took place in the Overton No. 2 mine of the Alabama Fuel & Iron Co., near Birmingham, Ala., Dec. 10, 1925, costing the lives of sixty-one men, no less than twenty men were saved from the toll of afterdamp by the use of self-rescuers, according to George A. Anderson, district inspector for the Associated Companies. On arriving at the mine, Mr. Anderson gathered up all the self-rescuers he could handle. On his way to the Fifth Level he met several men traveling to the surface who were equipped with self-rescuers. Wearing one of these masks himself, he explored Fifth Right entry in the upset airway and there found three men, to each of whom he gave a self-rescuer.

The Alabama Fuel & Iron Co. has a large supply of self-rescuers in the office for such an emergency. Furthermore, many of the miners were equipped with the mask by an optional plan whereby a man paid for the equipment in installments, one being deducted from each pay.

One of the victims found by the rescuers had the mouthpiece of his self-rescuer in his mouth, but had failed to attach the clip to his nose in time to save himself from carbon-monoxide poisoning. One man was found overcome with his head over his bucket, supposedly having been in the act of taking a drink before putting on his self-rescuer. One of the men saved by the rescue party said he had left his self-rescuer at home in a trunk. Several other men stated they had left their masks at home.

Fireboss Lowery of Overton No. 2, wearing a Gibbs apparatus went into the mine immediately after the explosion, and in the Fifth Right heading found six men who had not ventured out because of the presence of afterdamp outby the point where they were located. Two men had attempted escape and were killed, but the six men had decided to wait for help. Not having self-rescuers with him, Lowery went out and got six of them for the live men whom he had found. Protected with this equipment they made their way to the surface without assistance and in safety.

Fear Finds Creosoted Ties Lower Track Costs

T. G. Fear, general superintendent of the Inland Collieries Co., is enthusiastic over the results obtained from the use of creosoted mine ties in one section of Indianola mine, Indianola, Pa. About three years ago he had occasion to retrack the main haul of this section and then decided to use creosoted ties. These are protected from the wearing effect of rail movement by pressed-steel tie plates. The ties purchased were 5x7 in. and 5½ ft. long, yellow pine impregnated with 6 lb. of creosote per cu.ft. by the pressure-vacuum proc-

ess. A sawn cross-section of one of these ties selected at random, disclosed a thorough impregnation of the preservative to the heart of the wood.

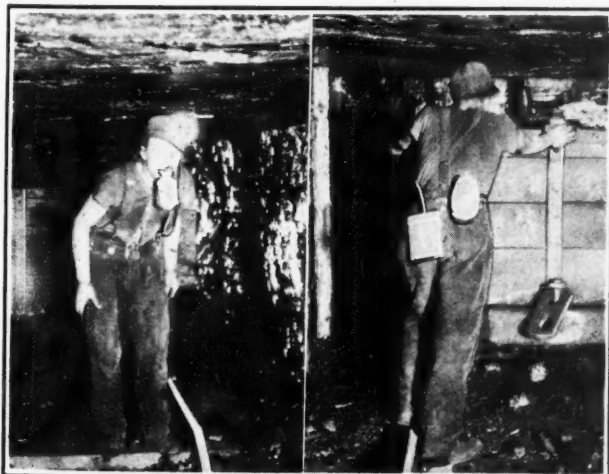
Mr. Fear's comments on this matter are worthy of careful consideration: The first cost of the treated ties is roughly 2½ times that of untreated ties of the same grade, but he estimates that they will last three times as long. The saving in this regard is slight; but when labor, interrupted operation and freedom from costly derailments with their accident hazards, are considered he is confident that a large saving is made. Much labor is involved whenever the ties have to be replaced. Furthermore, it is a difficult matter to restore the ballast and align the rails to their original state after new ties are inserted, particularly as the job is done under pressure on Sundays during holidays, at night and during off-shifts.

"Slab System" Suggestion Proves Valuable

Lew Roach, manager of the mines of the Elkhorn Piney Coal Mining Co. in eastern Kentucky and southern West Virginia, reports that the article on the "Slab System," by George E. Harkess, which appeared on page 822 of the Dec. 10 issue of *Coal Age*, supplied a suggestion which is proving of considerable value in Mine No. 1 at Weeksbury, Ky.

This mine is worked on the room-and-pillar system with rooms 24 ft. wide. The average height of the coal is approximately 43 in., and, generally speaking, the roof is fairly good, being sandstone in a large portion of the mine. The slabbing system of developing the 24-ft. rooms was first tried at Weeksbury about the middle of December and proved a success from the start. It has resulted in increased production per man, decreased car-gathering cost, increased percentage of lump and decreased explosives cost.

Besides the advantage of presenting loose ends for shooting down much of the coal, the system has the distinct advantage of making it possible to spot and load two cars at a time. This decreases the car-handling cost and cuts down delays. Mr. Roach reports that the loaders and mining-machine operators are enthusiastic over the system, and that it results in a gain of approximately 20 per cent in production per loader.

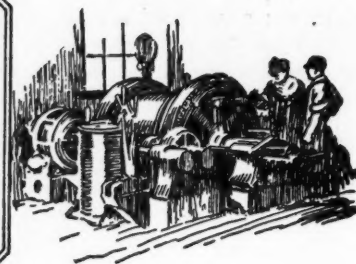


Self Rescuer in Service

The device, which saved lives in Overton, Ala., is a small canister containing a chemical which absorbs carbon monoxide. Attached to the canister are a mouthpiece and a nose clip. The total weight is less than 1 lb. At the right is shown a miner carrying the self rescuer, sealed in a tin can, on his belt. At the left, he has it in position for use.



Practical Pointers For Electrical And Mechanical Men



Fan Speed Is Controlled From Inside of the Mine

When variable-speed motors are attached to mine fans the reason, usually, is either to effect a power saving by supplying less air at times when there are few or no men in the mine, or to provide for an excess of air during periods of rapid development. On a new fan at the Nuttallburg (W. Va.) mine of the Fordson Coal Co., a motor of the variable-speed type has been installed primarily to compensate for changes in the temperature of the outside air. This machine is located at the top of a recently-completed rock slope and is at an elevation approximately 350 ft. higher than the main portal of the mine, as is shown in the accompanying sketch. The main opening is a drift in the side of New

River gorge, and the fan is located back from the stream on what might be termed the plateau or table-land of the region.

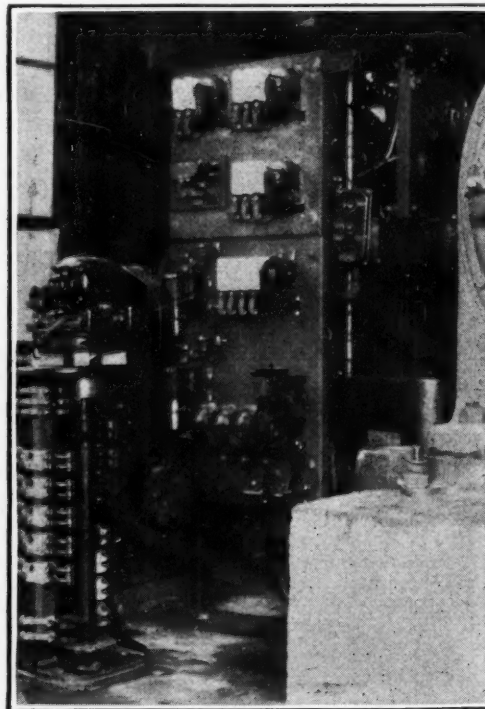
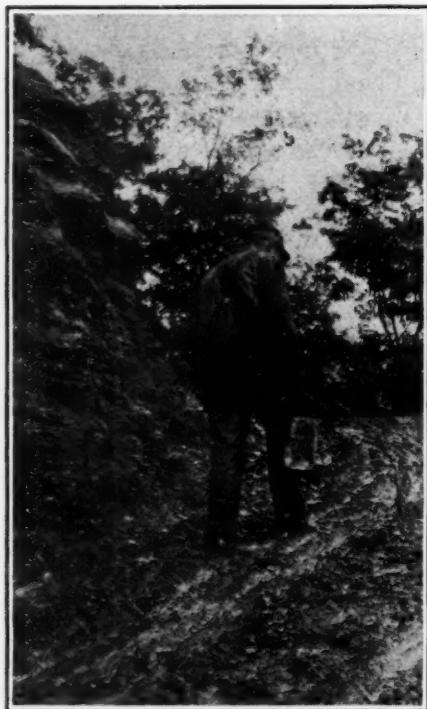
With the large difference in elevation between the two openings above noted temperature changes in the atmosphere must be counteracted with variations in fan speed if the quantity of air circulating through the mine is to be kept even approximately constant. On days when extreme temperatures prevail sufficient natural ventilation is obtained without the fan.

In order to eliminate the need for a man in constant attendance on the fan and to make it convenient for the mine foreman to start and stop the equipment or to alter its speed, a

remotely-controlled automatic starter with motor-driven secondary controller was installed. A control cable is carried from the fan, down the slope, and to a push-button station located at a central point in the mine. This station has four push buttons and an indicating light. The buttons and an indicating light, the latter are labelled "Start," "Stop," whenever the drum controller at the fan is between any two of the running points.

If the foreman finds that there is insufficient air circulating in the mine and therefore decides to run the fan "one notch" faster, he pushes the "fast" button and holds it until the lamp first lights up and then goes out whereupon he releases it immediately. The controller is then on the next-higher running notch.

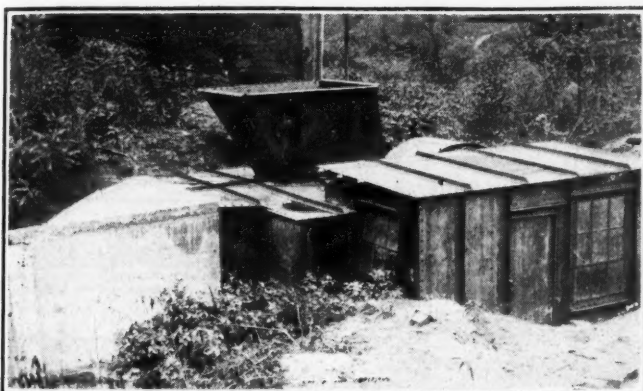
In case the foreman wants to de-



At Nuttallburg, the Fan Is Controlled from Within Mine to Keep a Constant Current Despite Variable Natural Ventilation Conditions

On the left is the muddy, steep, mountain road, a "good" part of two miles long, that leads from the tippie to the fan. This indicates why full-automatic control was used and provision made for changing the fan speed from inside the mine. In the center is the control station within the mine. From this point, the fan which is some 2,000 ft. distant and 350 ft. high in eleva-

tion, can be started, stopped or changed to any controller point. At the top of the upper box is a lens behind which is a lamp indicating the controller positions. On the right the edge of the 75-hp. slip-ring motor can be seen. To the left of the illustration is the automatic starter beside which can be seen the motor-driven drum controller which changes the fan speed.



Steel-Cased Fan

The small steel building adjoining the fan housing contains the 75-hp. motor and complete control equipment. A short silent-chain drive makes the arrangement compact. The motor house is locked and visited about once a month.

termine on which point the fan is operating, he holds the "Slow" button depressed until the lamp ceases to flicker on and off. This indicates that the controller has moved to the slowest point. Having counted the number of times that the lamp lighted up during this process he knows on what point the fan was operating. He can then push the "Fast" button and bring the speed back up the desired number of points.

Electrically there is nothing complicated about the arrangement. The 75-hp. 2,300-volt motor is of the wound-rotor type, and the automatic starter is a piece of standard equip-

permits of an extremely compact installation; the motor, automatic starter, motor-driven drum controller, secondary resistance and control transformers all being housed in a 6x12-ft. building.

As the fan is in an out-of-the-way place and is inspected only about once a month, precautions have been taken to protect the bearings in case of heating. All fan and motor bearings are fitted with thermostats. The electrical control equipment, although out of the ordinary, is but a combination of various pieces of standard equipment.

"Desmoking" a Smoky Coal For Smithing Purposes

Any good smithing fuel should contain only small quantities of sulphur and volatile matter. Sulphur tends to harden the metal heated and make it brittle and a high-volatile content makes the fire dirty and gummy, interfering with such processes as welding, simultaneously smoking up the whole shop. Some coal companies have long purchased smithing coal from other regions, but several southern Illinois operators "devolatilize" the product of their own mines before using it in their shop forges and furnaces. In this form the fuel is practically a coke.

Another type of coking furnace is that shown in Fig. 1 of the accompanying illustrations, this particular furnace being used at the No. 8 mine of the Old Ben Coal Corp., at West Frankfort. This consists of four walls of red brick, lined with firebrick above the grate or what would be the grate of an ordinary furnace, but which in this case is really a floor. The top is partially closed by means of firebrick blocks supported by old rails extending between the side walls. The outside dimensions of this furnace are roughly 6x5 ft.

and the height is approximately 6 ft. A twyer pipe supplied with suitable draft openings extends from rear to front.

Still another device intended for



Fig. 1—Old Ben Coking Furnace

This furnace much resembles a blacksmith's forge with side and end walls. From 200 to 400 lb. of coal may be coked in it per charge, the length of time necessary depending almost entirely on the quantity of coal treated.

this purpose is shown in Fig. 2, this photo being taken at the Valier mine of the Valier Coal Co. The sides and rear end of this furnace are built up of old rails to a height of about 3 ft. The front is left open and the bottom slanted from either side to the twyer pipe in the center.

All these furnaces are operated in a similar manner. A fire of paper, shavings and kindlings is first built over the twyer above which small coal is piled. If the charge is a large one, its top is covered with fine coal or even dirt. Draft, which is supplied by a fan, as a rule located within the shop building, is turned on when the fire is first lighted. This blast is continued until the entire mass burns clear and red and practically without smoke. The draft is shut off and the contents of the furnace thoroughly quenched with water.

The result is a small sized coke which, although it may be somewhat discolored, forms an excellent smithing fuel that may be used in the shop forges and furnaces with good results.

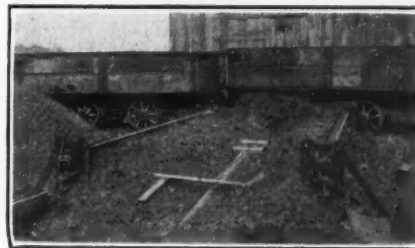
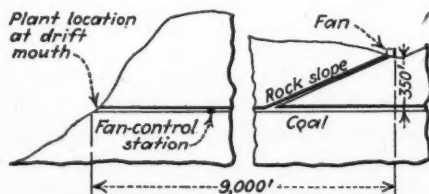


Fig. 2—Coking Furnace at Valier

Both sides and the rear end are made up of old rails. This furnace is of such size as to take several tons per charge, and the time necessary for coking may be several hours.



Sketch Showing Fan Location

The coal bed outcrops in the somewhat steep bank of the river while the fan is installed almost two miles inland on the plateau. In extreme weather natural ventilation furnishes sufficient air to the mine workings but the fan must supply any dearth when the temperatures of outside air and mine are nearly equal.

ment provided with an additional contactor for cutting out the secondary controller at starting. This provides for starting the motor with full secondary resistance in circuit, regardless of the point at which the drum controller is set. The fractional horsepower motor which drives the drum-controller cylinder is wound for 220-volts three-phase, this current being supplied by small transformers. One of these latter also supplies single-phase current for operating the contactors of the automatic starter and for the signal lamp at the push-button station.

The fan is a 5x3-ft. machine of the multi-bladed type fitted with a complete steel casing and motor-house. Silent-chain drive is used. This



News Of the Industry



Seek Plan to Settle Labor Problems In Soft Coal Industry; Congress Welcomes Shift of Responsibility

By Paul Wooton

Washington Correspondent of *Coal Age*

The bituminous coal industry, not to be outdone by the railroads and the anthracite producers, is considering what machinery it can set up to handle labor questions. Many operators think action of this sort is the best guarantee against having some half-baked plan foisted upon the industry by Congress.

Plans to this end have not taken definite form and the difficulties are such that they probably will move slowly. It is believed that Congress would welcome some assurance from the soft-coal producers that they will undertake to work out some plan of arbitration. When efforts were being made to draw the federal government into the anthracite strike some of the House leaders promised to consider coal legislation after the strike, when the situation would not be surcharged with emotion and when an opportunity would exist to consider the problem deliberately.

The real truth is that these leaders now are looking for a way out of their commitment. This loophole would be furnished were they to be able to point to active efforts in the bituminous-coal industry looking toward arbitration machinery. On the other hand they feel that they will have to go through with the program if the strike remains the only recourse in case of dispute.

Some consideration has been given the President's suggestion that the recommendations of the Harding Coal Commission be followed, but some difficulty has been found "in putting these pious proposals into legislative form," as one of those interested put it.

Congress Wary of Coal

Moreover, Congress wants to adjourn. There is a campaign coming on and the members are anxious to be free to participate. The legislative program already is longer than they wish. There are enough worries and uncertainties without adding such a controverted matter as coal legislation, so that any development which would make it unnecessary would be greeted with three cheers on both sides of the Capitol.

As has happened in every previous instance when coal legislation has been initiated, investigation reveals a fundamental obstacle in the form of a constitutional question. The attitude of the courts in the Federal Trade Com-

mission cases has thrown in doubt the whole question of compulsory returns of facts. If fact-finding were eliminated from the principal pending bills there would not be much left.

There is a disposition on the part of many members of Congress, and apparently on the part of the administration, to take at its face value the arbitration feature of the anthracite settlement. The belief of some observers that both sides will nominate agents, rather than arbitrators, is by no means universally held. In the paragraph of the settlement referring to arbitration it says "the Board shall be obligated within ninety days after appointment to arrive at a decision on all issues in controversy." The two arbitrators are obligated under the contract to arrive at a decision.

Conflict of Interpretations

The provision that these two "may enlarge the board to an odd number" has been the cause of some confusion. It does not say they shall add an odd member. If the two are obligated under the contract to agree, it seems plain, the permission to add a third member simply is a means to help them carry out the obligation of the contract, which is to agree. Apparently this clause is just as mandatory as that referring to "co-operation and efficiency." President Lewis, in speaking of that clause, declares that "it is a mandate just as strong as the English language can state it."

Regardless of the actual binding force of the arbitral feature of the agreement, Congress has been impressed sufficiently with the promise that it will work out to allay demand for the setting up of arbitration machinery by federal edict.

Advance View of Safety Film

An advance showing of the master film of the picture being prepared in co-operation with the Peabody Coal Co., Chicago, showing safety devices employed in coal mines, was made in Washington March 4 before members of the staff of the Bureau of Mines. The picture is in three reels and is one of the most pretentious thus far undertaken by the Bureau.

Lake Cargo Cases Reopened

The Lake Cargo Coal cases, in which a decision was handed down last July, have been reopened by the Interstate Commerce Commission. An order made public last week gives the parties to the case until March 22 to advise the Commission whether they desire to submit additional evidence. The cases were reopened upon the petitions of the original complainants, backed by the Pittsburgh Chamber of Commerce and the State of Pennsylvania.

At issue is the adjustment of rates from Ohio and western Pennsylvania to the lower lake ports as compared with rates from southern West Virginia and eastern Kentucky. The tentative opinion prepared by the examiners who heard the evidence recommended decreases in the rates from the two states first named. The opinion of the Commission, however, declined to disturb the existing adjustment and dismissed the complaints.

Urges State Fuel Commission In New York

Assemblyman Louis A. Cuvillier, Democrat, of New York, basing the necessity therefor upon action by the State Chamber of Commerce calling for a "fact finding" investigation of prices charged for fuel, introduced in the Assembly at Albany March 8 a bill creating a state fuel commission as a permanent agency of the state government and appropriating \$25,000 to enable it to carry out its proposed work.

The commission would consist of three members to be appointed by the Governor and to serve without pay except for their necessary expenses. The commission would have power to make a general investigation of the fuel industry and to fix the prices to be charged by the wholesaler and retailer.

Many of the provisions of the bill are adapted from the State Fuel Commission law enacted under Governor Miller, except that the Cuvillier bill contains no provision allowing the state to go into the business of buying and selling coal, and that it would constitute a permanent commission and not be subject to dissolution on the proclamation of the Governor as was the Miller law.

The bill was referred to Committee on Ways and Means.

Stocks of Substitutes At New York City Delay Movement of Anthracite

New York consumers were urged to use more bituminous coal or coke in an appeal issued March 3 by the New York State Coal Commission following a conference among representatives of the railroads, coal dealers and public organizations held in New York City. The statement pointed out that there is a congestion on the railroads because of an oversupply of soft coal for which there is a very limited demand. The Department of Health was asked to refrain from strict enforcement of the smoke ordinance until after April 1, in order to encourage the use of bituminous coal.

After the congested condition of the terminals had been pointed out at a meeting of the Atlantic States Shippers' Advisory Board earlier in the day, the Coal Commission issued its statement calling on the public to use soft coal or coke until adequate supplies of anthracite can be obtained. In line with the petition of the Advisory Board the commission in its statement expressed the hope that "the authorities will co-operate in regard to the enforcement of the smoke ordinance."

Figures reported by the American Railway Association and read in the meeting of the Atlantic States Shippers' Advisory Board showed that on March 3 there were 8,498 cars of coal, totaling more than 450,000 tons, in the New York tidewater terminals, while an additional 3,945 cars, containing about 200,000 tons, were being held at points outside the tidewater terminals awaiting orders for movement and the relief of congestion already existing. Of this total of 12,443 cars, only 1,887 contained anthracite; the remainder being bituminous coal, together with something over 1,000 cars of coke.

Congestion Is Widespread

A. G. Warren, who represented E. J. Cleave, district manager of the American Railway Association, at the meeting, explained that cars being held outside of the terminals because of congested conditions extended as far west as Harrisburg and as far south as the Maryland division of the Pennsylvania R.R.

In its statement the advisory board declared that "the supply of anthracite will not be sufficient to satisfy the full demands of the New York district before May 15," and warned that "restricted deliveries of bituminous coal on hand and in transit will ultimately affect the supply of cars for the movement of anthracite in the district."

George J. Eltz, member of the New York State Coal Commission and of the Coal Merchants' Association, in summing up the situation, said there is an oversupply of soft coal and coke on hand which must be used in order to free the transit and terminal facilities for the handling of anthracite.

"Whether the public wants to continue the use of soft coal or no," he declared, "it must do so or do without coal. However, it may be assured that there will be no increase in the price



Hugh Shirkie

Who will succeed the late Col. D. B. Wentz as president of the American Mining Congress. Mr. Shirkie was elected by the directorate at a special meeting called in Chicago, March 8. He is a well-known operator, being president of the Shirkie Coal Co., Terre Haute, Ind.

of anthracite even though the demand is far greater than the supply."

The statement of the Coal Commission was as follows:

"Sufficient anthracite is not yet reaching the New York market to supply the demand. Owing to congestion at the railroad terminals and to the backing up of cars filled with substitutes, as reported by the American Railway Association, it will be several weeks before sufficient anthracite can be supplied.

"Under these considerations, this commission urges consumers to use low volatile mine-run soft coal or coke when anthracite cannot be obtained."

Dr. Louis I. Harris, Health Commissioner of New York City, said last Thursday that by March 10 he would have reports on the coal situation from the State Coal Commission, the dealers, the railroads and his own investigators, when it would be decided when the complete elimination of smoke would be required.

"This does not mean that I am enthusiastic about the present state of the atmosphere, but it is reasonably good," he said.

Senate Defers Naming Hunt To Trade Commission

After nearly two hours' discussion of the reappointment of Charles W. Hunt, of Iowa, to be a member of the Federal Trade Commission, the Senate in executive session on March 5 deferred action until a later date.

The fight against reappointment was led by Senator King, Democrat, Utah, who charged that Hunt was a reactionary and was not enforcing the law. The appointee was defended by Chairman Cummins of the Senate Judiciary Committee. Another attempt probably will be made this week to get action on the nomination, with indications that it will be confirmed when it comes to a vote.

Chamber Backs Downing Bill; Hits Retail Prices

The Chamber of Commerce of the State of New York has indorsed the Downing bill to make the State Public Service Commission a coal fact-finding agency. This action was taken by the Chamber at its regular monthly meeting at New York City last Thursday, following the presentation of a report on coal prices made by the Chamber's committee on public service in the metropolitan district. The organization did not go on record, however, until after Major Elihu Church, local fuel administrator during the 1922 crisis, had attacked the report and asked that it be referred back to the committee for further consideration.

The report, based upon a survey of prices charged by the cellar trade and peddlers for coal in bag lots, exonerated the cellar dealers of charging exorbitant profits although these dealers were charging 54 to 106 per cent over the prices they claimed to be paying for the coal at the retail pockets. "Profiteering is and has been going on," asserted the report and the large retailers must bear some of the onus of oppressive prices. At the same time, the report admitted that the co-operation of some retailers had held down bag prices in certain sections of the city. In offering its recommendations for the future the committee said:

Your committee does not recommend at this time the establishment of a governmental body with regulatory and judicial power over coal. In fact, this Chamber is strongly opposed to federal regulation in actions taken in March, 1921, and December, 1925. What it does recommend is the establishment in the State of New York, as soon as possible, of a fact-finding agency which shall have the power to subpoena witnesses under oath, and thus obtain exact information upon actual costs of coal, upon profits obtained and upon what profit is reasonable. This fact-finding agency should begin its investigations at an early date that it may be ready and fully advised for action in the next fuel emergency. Generally the mere prospect of publicity of the fact that a seller has been found to be profiteering is sufficient to stop such practice.

Retailers Criticize Report

J. Vipond Davies presented the report and moved its adoption. The report, he said, had been criticized by the retail interests. The Chamber was asked by the New York State Retail Coal Merchants' Association to give the retail trade a hearing before taking final action, but this request was ignored by the Chamber.

Major Church, in moving that the report be referred back to the committee, condemned the committee for its failure to consult with the retailers and for comparing, without identifying, prices on screened bituminous with contract figures on mine-run coal. He also wanted to know whether Frederick H. Ecker, president of the Chamber and member of Governor Smith's coal advisory commission, had ever sought information through that commission.

Condemning the fact-finding proposal as useless for emergency operation, Major Church remarked that there were small boys who liked to collect "birds' eggs and lead pencils without knowing just why. When these boys grow up, they want to collect facts."

Fayette-Greene Operators Canvass Coal Industry's Needs in Pennsylvania

Pennsylvania's fight for more favorable freight rates on coal and recognition by membership on federal agencies will continue unswervingly until its aim has been accomplished, U. S. Senator David A. Reed told 322 coal and coke operators representing 92 per cent of the bituminous tonnage of the western Pennsylvania field at the third annual banquet of the Fayette-Greene Coal Producers Association at the White Swan Hotel, Uniontown, Pa., March 6.

Operators, intelligently organized and directed, must get into the fight, said Charles O'Neill, secretary-treasurer of the Central Pennsylvania Coal Producers Association. William H. Donner, president of the Donner Steel Co., gave instances of alleged rate discrimination against Pennsylvania coal. Many of these rates, he said, had been arbitrarily made during the war while the railroads were under federal control.

Delbert H. Pape, assistant executive secretary of the National Coal Association, spoke on the importance of research and statistics to the bituminous coal industry.

State to "Fight for Rights"

Senator Reed, in outlining the campaign now being waged in behalf of Pennsylvania's coal industry, showed how the state has been ignored in representation on important governmental agencies. "We know why so many of our mines are shut down, so many of our blast furnaces cold, so many of our train crews idle," said he, "and we intend not only to demand our rights but to fight for them, and this means not only to demand that Pennsylvania have a fair share in these appointments but to fight all appointments from other states until Pennsylvania's just claims are recognized."

Mr. O'Neill presented interesting data on tonnage changes in coal. He referred in detail to rate cases now pending, including the all-rail rate case to New England states from West Virginia, and the lake cargo and tidewater cases. "The wage question is being solved by the operators of Pennsylvania," he declared. "Reductions in wage levels are gradually being made throughout the state and accepted by the miners, despite opposition to this sound policy by the United Mine Workers. There has been no disposition on the part of the railroads, however, to meet the necessity of the situation by readjustment of their freight rates on coal. The rates from Pennsylvania in all directions are in every instance on a much higher level per ton mile than the rates from the southern fields that are competitive with Pennsylvania and are rapidly taking their markets."

"It is true of coal in only a slightly less degree than it is of oil," said Mr. Pape, "that the burning of raw coal under a boiler involves the waste of certain constituent elements of the coal that could be much more profitably utilized for other purposes. Chemical research into methods of carbonizing coal and into the utilization of the by-

British Dole in 7 Years Costs £240,000,000

Great Britain's out of work "dole," which is credited in many quarters with saving the nation from industrial disaster and is bitterly assailed by others as a soporific influence, has cost the government nearly £240,000,000 since it was first instituted, in January, 1919.

Sir Arthur Steel-Maitland, British Minister of Labor, stated in the House of Commons March 3 that the payments in unemployment insurance by the government totaled approximately £239,830,000. He added that 855,000 persons were "on the dole" for the week ended Feb. 20.

products obtained during the process is a field which has as yet hardly been scratched and whose possibilities are almost immeasurable.

"In support of this statement let me quote a paragraph from a paper entitled 'A Critical Analysis of the Future Demand for Gasoline and Lubricating Oils for Automotive Uses,' read before a meeting of the Society of Automotive Engineers by its president, H. L. Horn- ing. The quotation is as follows:

"... coal is the most promising of all our sources of raw material. By this I do not expect the well-known aromatics derived in the usual distillation to be the source of coal fuels, but on the contrary, I expect developments in chemistry within the next decade to show us how to convert coal directly into motor fuels as primary products and with valuable byproducts. There probably exist today suppressed, known, or awaiting development, facts which constitute the very basis for this great step. I am absolutely certain that organic chemistry could solve this in a little time. When these changes will come about depends on economic causes and not for want of scientific ability. Economic changes will always lag behind scientific achievement."

"While the development of more economical methods of burning coal may in the first instance tend to contract rather than expand its market and benefit the industry only after the reduction in the cost of coal as fuel has enabled it to replace oil and electricity, the discovery of new byproducts or of new methods of utilizing the byproducts already known may bring with it an expansion in the demand for coal of very large proportions. I need only refer to the effect of the by no means impossible development of satisfactory fuel for internal combustion engines from the distillation of coal."

Officials indicated that definite action would be taken within a week to launch an aggressive program to obtain relief for the region from the conditions attacked.

W. Russell Carr, local attorney, was toastmaster. G. Carl Areford of Uniontown is president of the Fayette-Greene Coal Producers Association; W. W. Parshall, vice-president; T. M. Whyel, treasurer, and J. Fred Shean, secretary.

Believe 28 Dead in Explosion In Eccles (W. Va.) Mine

Twenty-eight miners were entombed and are believed to have perished as the result of explosions early in the evening of March 8 in mines Nos. 5 and 6 of the Crab Orchard Improvement Co., near Eccles, W. Va. Thirty-seven men were rescued and one body was recovered after the disaster, but officials of the company, in checking up at 1 a.m. following the blasts, held out little hope for the twenty-eight men still in the mine.

The first explosion, according to mine officials, occurred in No. 5, where twenty-nine men were working, and spread to No. 6, imprisoning thirty-seven others. Rescue crews went into No. 6 soon after the blast occurred, and brought out the thirty-seven survivors. Two of this crew are missing. They said this mine was little affected by the explosion. No. 5 mine was filled with poisonous gases and the rescue men could not go down the shaft. The body of the one man lost was found in a lateral connecting the mines.

Many of those rescued were burned and gassed. The shaft of No. 5 was wrecked by the blast, closing this entry to the rescuers, who were working through No. 6 in the effort to learn the fate of the entombed men. These men formed the night shift of No. 5.

The explosion occurred in the same mine that was wrecked by a gas explosion in April, 1914, with 186 fatalities. At that time it was an open light that ignited the coal gas and caused the disaster. No explanation of Monday's explosion has been received.

The Crab Orchard Improvement Co., which operates the mine in which the explosion occurred, is a subsidiary of the Stonega Coke & Coal Co. of Big Stone Gap, Va.

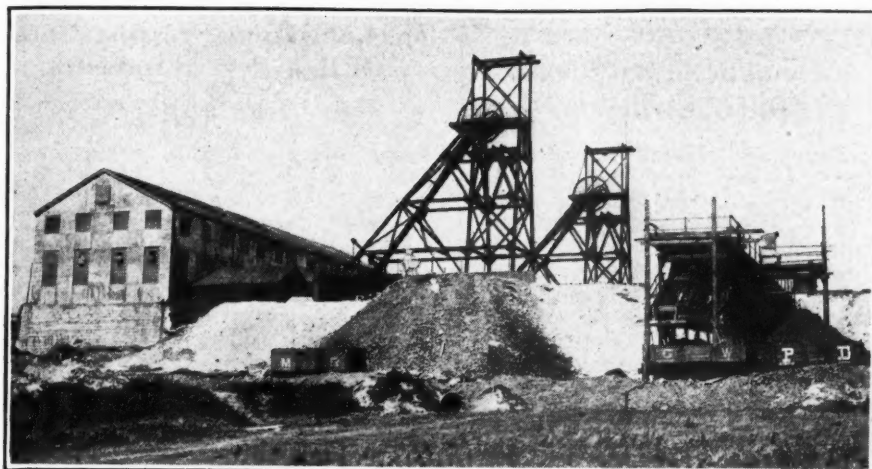
Mine No. 5 lies at the bottom of a 520-ft. shaft and is underneath Mine No. 6, which has a depth of 250 ft. A connecting shaft joins the two. No. 6 is located on the Sewell coal seam, while No. 5 is on the Beckley seam.

Open Coal Statistics Bureau In Huntington

The Bureau of Coal Statistics of the high-volatile fields of southern West Virginia, eastern Kentucky and Virginia was opened Feb. 25 in the First Huntington National Bank Building, Huntington, W. Va. F. C. Respass, formerly of Williamson, is secretary of the bureau, which will compile reports of past sales in the high-volatile fields.

The bureau is sponsored by several coal associations and directed by officers of these associations. Bureau officers are: William L. Cummins, of Red Jacket; D. H. Morton, president of the Kanawha Coal Operators' Association, of Charleston; S. W. Patterson, of Huntington; J. S. McKeever, of the Kanawha association; G. W. Bausewine, Jr., secretary of the Williamson association, and D. C. Kennedy, secretary of the Kanawha association.

At present reports are being received from the Kanawha and Williamson fields, but Logan, northeastern Kentucky and the Clinchfield valley will be covered later.



New Chislet Colliery at Westbere Court, Kent, England

This mine, four miles from Herne Bay, is one of five in Kent, England, and therefore not far distant from London. The British Government proposes to guarantee the principal and interest on a loan of \$10,000,000 for the development of the Kentish fields, to be spent by Messrs. Pearson & Dorman Long, Ltd.

Ask Federal Aid for Coal Industry in Canada

Protection to the coal mining industry of Canada such as the United States Government grants American coal interests, is asked of the Dominion Government, in a resolution adopted March 3 at the opening session of the 28th annual general meeting of the Canadian Institute of Mining and Metallurgy. The meeting lasted three days at the Windsor Hotel, Montreal.

A request for government protection of Canadian coal interests against the dumping of American coals originally was put in the form of a resolution adopted at the western meeting of the association held at Winnipeg last November.

W. LeB. Ross, of Winnipeg, declared that the interests of not only the west but the east were involved in this matter, that coal being produced in the western provinces needed protection against the dumping of coal in their parts by United States interests, as well as in the Maritimes.

Ford Tipple at Stone, Ky., Destroyed by Fire

Fire of undetermined origin completely destroyed the coal tipple of the No. 5 operation of the Fordson Coal Co., located near Stone, Ky., at 10:30 p.m. March 5, causing damage estimated at \$50,000. Until checked by a volunteer bucket brigade the flames threatened to spread into homes of miners.

The fire, which was confined to the tipple by the volunteer firemen, threw 225 miners temporarily out of employment. Officials of the coal company announced, however, that the workmen would be given employment in other operations of the company until the tipple of the No. 5 mine can be replaced. All equipment in the tipple was destroyed.

Plans have already been discussed by mine officials for the replacement of the tipple with a modern one of entire steel construction, and it is expected that work on the new structure will begin in the next few days.

Double Tracking Held Up By I. C. C. Ruling

With the rejection by the Interstate Commerce Commission of the application of the Van Sweringen interests of Cleveland to consolidate a number of railroads in the Middle West, particularly the Chesapeake & Ohio, the Hocking Valley, the Nickel Plate and Erie, officials of the Hocking Valley announce that completion of the work of double tracking the Hocking Valley from Columbus to Toledo has been held up until a favorable ruling is had from the Commission. A part of the double tracking project was completed last summer and it was planned to go ahead with the work at once, completing the line from Columbus into Waybridge, near Toledo. The project to build a line 63 miles in length from Gregg, Pike County, Ohio, to Valley Crossing near Columbus, connecting the Norfolk & Western and the C. & O. and carrying coal traffic now routed over the N. & W. from Waverly into Columbus also has been abandoned.

Names Committee to Arrange N. C. A. Convention

Morton L. Gould, president of the National Coal Association, last week named the following committee to select the date and place and outline the program for the 1926 meeting of the National Coal Association: Telford Lewis (chairman), vice-president, Jasahill Coal Mining Co., Johnstown, Pa.; D. C. Kennedy, secy., Kanawha Coal Operators' Association., Charleston, W. Va.; Otis Mouser, president, Stonega Coke & Coal Co., Philadelphia, Pa.; C. F. Richardson, president, West Kentucky Coal Co., Sturgis, Ky.; Hugh Shirkie, president, Shirkie Coal Co., Terre Haute, Ind.; C. F. Spencer, president, Pittsburg & Midway Coal Mining Co., Pittsburg, Kan.; Ezra Van Horn, general manager, Clarkson Coal Mining Co., Cleveland, Ohio.

At a meeting at the Waldorf-Astoria, New York City, on March 23, the committee will consider invitations from commercial and civic bodies representing thirty-four cities.

Pittsburgh Coal Co. Has Deficit in 1925 Due to Curtailed Operations

High wages paid to coal miners and the suspension of operations at many mines because they were being operated at a loss are blamed for a deficit of \$1,266,940 in the revenues of the Pittsburgh Coal Co. for 1925, according to W. G. Warden, chairman of the board of directors. This compares with a net loss of \$454,083 in 1924.

The annual report shows gross receipts of \$33,832,177 for 1925, against \$44,025,345 in the preceding year. The company has earned nothing on either the preferred or common stocks for the last two years. The general balance sheet shows current assets of \$16,332,718 and current liabilities of \$2,781,529. Total assets were valued at \$158,262,244.

In his report to stockholders Mr. Warden said:

"The extremely difficult conditions confronting the company in 1924 continued without abatement during 1925. Facing the certainty that the price of soft coal in its markets would continue to be fixed by the producers employing non-union labor, including those of the remote freight rate-favored districts of southern West Virginia and eastern Kentucky, and that in consequence it would not be possible to market the product of the company's mines except at prices below production costs under the existing wage scale continuing until April 1, 1927, your officers early in the year, with other producers in Pittsburgh, urged the officers of the United Mine Workers to meet in conference looking to a return to the wage scale of November, 1917. The request, however, was refused notwithstanding that twice during the year 1917 and again in 1920 they had been granted upward revisions of the wage scales then in effect.

"After careful study of every phase of the situation so developed, it was the unanimous judgment of your directors that the mines ought not longer be operated at a loss. Accordingly, the company's mines in the Pittsburgh district were closed down one after another and before the end of May all had been closed, operations of its Ohio mines having been discontinued early in the preceding year."

The mines were reopened in November, according to Mr. Warden, on a wage scale equal to that of November, 1917. The number of men employed has steadily if slowly increased, until at this date at all of the mines of the company there are about 3,000 men at work, producing approximately 12,000 tons a day, equal to 17 per cent of capacity.

C. & O. to Open Coal Bids

Word has been received in Charleston that the Chesapeake & Ohio R.R. will open bids March 15 on from 105,000 to 135,000 net tons of coal to supply its fuel needs during the next coal year. The bids will be submitted to the headquarters of the fuel department in Richmond, Va.

Heroism Awards Voted To West Virginia and Alabama Coal Miners

The Joseph A. Holmes Safety Association on March 5 voted awards for heroism to Lee Fetty and John McNeil, of Farmington, W. Va., and to R. D. Taylor, of Attala, Ala.

Mr. Fetty, who was machine boss in the No. 8 mine of the Jamison Coal & Coke Co., Farmington, W. Va., was on duty in the 20th right section of the No. 8 Mine on the night of Jan. 14, 1926, when an explosion occurred in the 7th right group of entries, which resulted in the loss of the lives of 19 persons. The explosion shut off the ventilation from the section of the mine in which Fetty was working and he stated that he felt a puff of air such as is produced by a fall of roof in the mine, following which he noticed that the air had ceased to circulate. He also found that the air compressor had stopped and there was no electric power at the air compressor.

Find Safety in Stable

After having gotten together all of the men he decided that the air compressor station was too small in which to barricade the men and conducted them to the 20th left entry, adjoining an underground stable, and directed the men to remain there under the seal of the doors and other barricades that they might construct until fresh air reached them. He then made an exploration toward the shaft and found that he was able to get down only to the 16th left entry, which was about 1000 ft. from the stable. At this point he encountered very strong afterdamp and retreated and reported to the men that it would not be possible for any men to get through the afterdamp. Three men disregarded his instruction, however, and attempted to go out through it, two of them losing their lives, the third being able to retreat to the barricade.

In Barricade Nineteen Hours

The general superintendent of the mine, W. C. Dobbie, stated that in his judgment, after talking with all of the men who were saved by barricading, Mr. Fetty was wholly responsible for gathering up the men and directing them to the 20th left, where they barricaded themselves. After having been in this barricade for 19 hours, Fetty went out into the main entry and discovered that fresh air was beginning to circulate. He then led all of the men in the barricade toward the shaft and on their way out they met the men who were engaged in conducting the air into the mine.

John McNeil, a compressor engineer at No. 8 mine, was on duty in the compressor station of the mine at the time of the explosion and assisted Mr. Fetty in the protection of their fellow workmen.

While R. D. Taylor saved no life he jeopardized his own life in an effort to protect one of his comrades on Dec. 19, 1925, at the bottom of the No. 2 slope, Attala Mine, Sloss-Sheffield Steel & Iron Co., in Alabama. A crew of miners had finished their day's work

Economic Crises Blamed On Governments

Economic fluctuations and crises are not invariably the result of private initiative, but are oftentimes influenced, as regards the development of international trade, by harsh measures of government, according to a report drawn up by the mixed committee on economic crises for the League of Nations Council and made public at Geneva, Switzerland, March 5. Modification of the methods employed by the authorities since the war, in the opinion of the committee, an Associated Press dispatch says, would attenuate the gravity of world economic crises.

The committee places emphasis on the necessity of establishing complete, accurate indices for the measurement of fluctuations of economic activity and the compilation of statistics of industrial production and stocks as a guidance for further studies.

and preparations were being made to fire a round of 10 holes, charged with 40 per cent gelatin dynamite, each charge to be fired with a detonator by means of fuse. A pump was located 32 ft. above the bottom of the slope and preparatory to firing the charges the suction pipe was removed and carried into the pumproom by Alex Logan and Oscar Harris. Harris opened the electric switch in the pump room and called "All right," which R. D. Taylor, another workman, understood as a signal to light the fuse, which he proceeded to do. It appears that when Harris threw the oil switch he fell into the electric wires.

Logan stood on the slope near the entrance to the pumproom to display his light so Taylor would be able to see his way back to safety. Upon lighting all of the fuses he started up the slope and Logan, who was 40 ft. further up the slope, called out "There's a dead man in there." Taylor turned and could see the prostrate form of Harris. He immediately rushed to the bottom of the slope, hoping to be able to cut off the fuses. He succeeded in cutting off three or four, but as some of the shorter fuses had burned down to the collar of the hole he immediately retreated up the slope a distance of 50 ft., where he found refuge in a room. Immediately following the discharge of the several shots Taylor and Thomas returned to Harris and moved his body from contact with the wires and endeavored to resuscitate him, but without success.

New Directors Elected

Scott Turner, president of the association, presided. George S. Rice, General W. H. Bixby, Alan H. Willett, and J. J. Rutledge were elected directors for the ensuing year. James F. Callbreath was elected first vice-president and William Green second vice-president. T. T. Read resigned as secretary of the association, as he enters upon his new duties with the American Institute of Mining and Metallurgical Engineers March 15.

Mechanization Pressing Need Of British Coal Industry

Grouping of collieries by mergers, in order to bring about greater mechanization and higher efficiency in operation, is advocated by Sir Richard Redmayne, K.C.B., as one of the chief needs of the British coal industry. Sir Richard, who is a member of the Safety in Mines Research Board and formerly was Chief Inspector of Mines, offered this suggestion in the course of a lecture recently delivered at the University of Sheffield, England. It was the first of a series of six lectures by authorities on "Some Problems of the Mining Industry."

Sir Richard divided his talk into three parts: the economics of production, of distribution and of consumption. More extensive use of machinery was necessary he said, in order to increase output per man per shift. Only in this way, he thought, could Great Britain keep pace with Germany, her chief competitor, whose labor costs were lower. Cheaper production, he said, would help the industry not only in Great Britain but throughout the world, as it would encourage the more extensive use of coal.

If the coal producers would combine to form a selling association and retail their own coal, said he, quite a saving could be made to the consumer. A colliery in Northumberland started to retail its own coal and reduced the price of coal to the consumer about 7s. a ton. All of Germany's coal was being sold by a syndicate and very few dealers were being employed in the cities.

Sees Economy in Carbonization

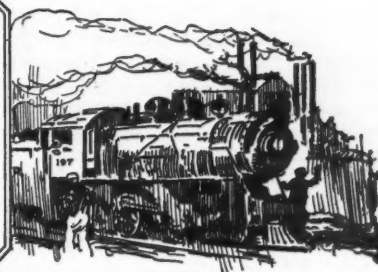
In the matter of consumption of the coal he thought that the greatest saving could be effected through carbonization. All of the coal could not be made into metallurgical coke nor could all coals be made into low-temperature cokes for domestic use. By combining a low-temperature carbonization plant with an electric generating plant the greatest power could be gotten from the coal and the valuable byproducts of distillation recovered.

Tennessee Products Corp. Issues Bonds

The Tennessee Products Corporation announces a new issue of \$1,500,000 first mortgage 6½ per cent ten-year sinking fund bonds, which is being marketed by Rogers Caldwell & Co.; Taylor, Ewart & Co. and the American National Co. The Tennessee Products Corporation recently was formed by the merger of the Chattanooga Coke & Gas Co., Inc.; Bon Air Coal & Iron Corp. and J. J. Gray, Jr., and owns or controls properties located at Chattanooga, Goodrich, Eastland, Clifty, Rockdale, Bon Air, Ravenscroft, Clarks-ville, Collinwood and Lyle, Tenn. The proceeds from the sale of these bonds and certain junior securities will be used for the acquisition of properties and for working capital, betterments and corporate purposes.



Production And the Market



Sharp Drop in Output and Ease in Price Decline Feature Bituminous Coal Market

The coal trade of the country is still engaged in working out the problems created by the juxtaposition of the unexpected resumption in anthracite mining and the seasonal decline in soft-coal demand. The readjustments necessary are being effected with surprisingly few major upsets to business. Such changes as have taken place were, for the most part, anticipated and discounted.

Sharp reductions in the production of bituminous coal and a milder rate of decline in price levels mark the course of the market. Output the last week in February, according to the Bureau of Mines, dropped to 10,895,000 net tons. Preliminary figures point to further declines during the first week in March. Nevertheless, there is too much unsold coal on wheels to make the situation comfortable.

However, even that admittedly bad situation has been ameliorated somewhat by sharper weather in the West and by railroad purchases of tonnages rejected by retailers in the East. A check against adding to these accumulations is found in the increasing number of mine shutdowns.

Price Levels Descending

Spot prices on bituminous coal are again at the same levels as ruled a year ago. *Coal Age* Index for March 8 was 167 and the corresponding price was \$2.02. Compared with the preceding week this was a loss of two points in both index figure and average price. Generally speaking, all tidewater prices receded. Inland, prices on sized coal weakened, but quotations on slack advanced. This latter increase was due more to decreased output than to any expansion in industrial demand.

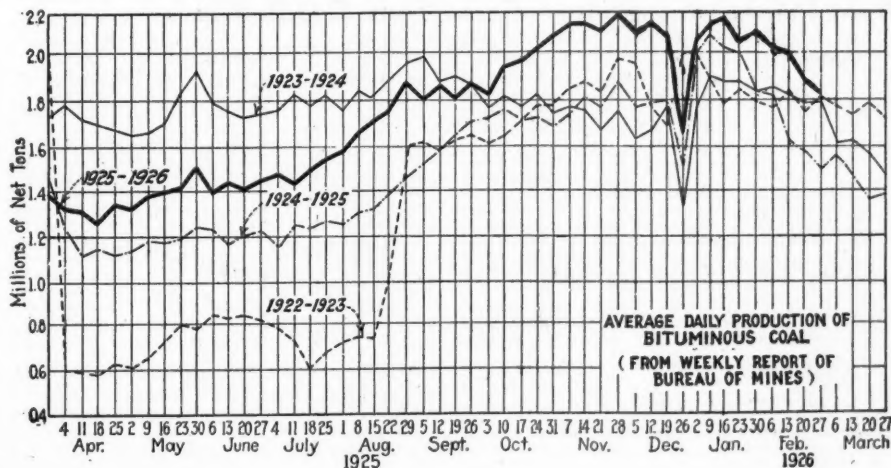
Contract developments to date have been kept well under cover. At present the outlook in the East from the standpoint of prices is not promising and the freedom with which coal is moved in all parts of the country gives the buyer the initial advantage in price haggling. Much, of course, will depend upon the development of the lake trade. The revival of the lake rate fight will not assist an early clarification of the situation.

Anthracite Production Up

Anthracite production, which got off to a bad start, made a quick recovery the last week of February, when the output reached 1,611,000 net tons. This tonnage is being fed out over as wide an area as possible—particularly by the larger producers. Some of the smaller independents are racing for the markets which will pay the highest prices. The day of extravagant premiums, however, will be short and its decline already has set in.

The most interesting feature in the current anthracite situation is the apparent scarcity of the usually despised pea coal. New York complained of this two weeks ago; Philadelphia protested last week. There also is a better demand than usual from household consumers for No. 1 buckwheat. In the steam trade, however, the small sizes are facing hot competition from the bituminous coals and independent prices are slipping.

Production of beehive coke is rapidly declining. For the week ended Feb. 27 the decrease was over 26,000 tons. The ovens must now look to the metallurgical trade for an outlet to their production. There has been an increase in orders placed by the foundries, but spot buying of furnace coke has been negligible. Some operators are entering the gas market with raw coal.



Estimates of Production

(Net Tons)

BITUMINOUS

	1925	1926
Feb. 13.....	9,758,000	12,011,000
Feb. 20 (a).....	9,464,000	11,509,000
Feb. 27 (b).....	8,855,000	10,895,000
Daily average.....	1,501,000	1,847,000
Coal yr. to date.. (c)	433,506,000	494,597,000
Daily av. to date..	1,550,000	1,765,000

ANTHRACITE

Feb. 13.....	1,824,000	35,000
Feb. 20 (a).....	1,838,000	406,000
Feb. 27 (b).....	1,605,000	1,611,000
Coal yr. to date.. (c)	79,163,000	42,735,000

BEEHIVE COKE

Feb. 20 (a).....	259,000	353,000
Feb. 27 (b).....	234,000	321,000
Cal. yr. to date.. (c)	2,182,000	2,782,000

(a) Revised since last report. (b) Subject to revision. (c) Adjusted to equalize number of days in the two years.

Middle Western Screenings Up

Advances of 5 to 25c. per ton featured the market in screenings in the Middle West last week. The increase was due to curtailed output following the slump in demand for prepared sizes rather than an expansion in the requirements of industrial consumers. Illinois, Indiana and western Kentucky mine-run, on the other hand, have not benefited by the change.

Prices on prepared coals have been fairly well maintained. Southern Illinois 6-in. lump commands \$2.75@3, with strip-pit offerings 50c.@1 under those figures. Central Illinois is \$2.50 @ \$2.75. The widest range is in Indiana—\$2.25@3. A cold snap helped the market, but it is realized that these flurries can have no lasting effect.

More mines are closing down every day and some of the miners are deserting the fields. Further demoralization of union operations in Illinois and Indiana is feared as a result of the announcement that one of the largest

producers in the first-named state has taken over the output of a number of mines in non-union western Kentucky.

Outlying Fields Also Hard Hit

The other Illinois producing districts are faring no better than the central and southern fields. Some mines in Duquoin and Jackson County are having a hard time to find a market for two days' output; only the most fortunate can average four days a week. Contract tonnage represents the bulk of the movement from the Mt. Olive section. Operators in the Standard district still seem bent upon seeing how much tonnage can be sold at a loss. There are unconfirmed rumors that several Belleville mines will go on a co-operative basis.

Eastern coals had hard sledding in the Chicago market last week. One eastern Kentucky operator cut his circular from \$2.50 to \$2.25 and competing producers soon followed his lead. Not to be outdone, some West Virginia

shippers cut 4-in. high-volatile block to \$2, although the general range is \$2.25@2.75. Smokeless factors have held lump, egg and nut at \$3.50@4, but mine-run is to be picked up at \$1.75.

Up to the close of last week there had been no real movement of anthracite into Chicago. The fact that shipments were en route, however, induced retailers to let go of scanty stocks in their yards at \$17 for egg, range and nut. Shippers of first quality coke are busy catching up on unfilled orders and prices are strong.

Kentucky Domestic Slump Grows

Demand for prepared coal from Kentucky mines still is slipping. Intermittent cold spells do not bolster up the market, as retailers are more interested in cleaning up yard stocks than in ordering more coal forward. A quarter has been clipped off the top prices on block coals. Eastern Kentucky block is \$2.25@2.75; lump, \$2@2.25; egg, \$1.75@2; nut, \$1.65@2.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern					Midwest				
	Market Quoted	Mar. 9, 1925	Feb. 22, 1926	Mar. 1, 1926		Market Quoted	Mar. 9, 1925	Feb. 22, 1926	Mar. 1, 1926
Smokeless lump.....	Columbus...	\$3.60	\$4.35	\$4.35	Franklin, Ill. lump.....	Chicago.....	\$3.10	\$3.00	\$3.00
Smokeless mine run.....	Columbus...	1.90	2.50	2.35	Franklin, Ill. mine run.....	Chicago.....	2.35	2.40	2.40
Smokeless screenings.....	Columbus...	1.15	1.60	1.25	Franklin, Ill. screenings.....	Chicago.....	2.00	1.55	1.55
Smokeless lump.....	Chicago...	3.10	4.10	4.10	Central, Ill. lump.....	Chicago.....	2.85	2.60	2.60
Smokeless mine run.....	Chicago...	1.75	2.10	2.10	Central, Ill. mine run.....	Chicago.....	2.20	2.10	2.10
Smokeless lump.....	Cincinnati...	3.25	4.35	4.00	Central, Ill. screenings.....	Chicago.....	1.90	1.10	1.10
Smokeless mine run.....	Cincinnati...	2.00	2.35	2.10	Ind. 4th Vein lump.....	Chicago.....	2.85	2.85	2.85
Smokeless screenings.....	Cincinnati...	1.60	1.35	1.30	Ind. 4th Vein mine run.....	Chicago.....	2.35	2.30	2.30
*Smokeless mine run.....	Boston.....	4.30	4.85	4.70	Ind. 4th Vein screenings.....	Chicago.....	1.95	1.70	1.70
Clearfield mine run.....	Boston.....	1.95	2.00	2.05	Ind. 5th Vein lump.....	Chicago.....	2.50	2.15	2.15
Cambria mine run.....	Boston.....	2.30	2.30	2.40	Ind. 5th Vein mine run.....	Chicago.....	2.10	1.95	1.95
Somerset mine run.....	Boston.....	2.10	2.10	2.15	Ind. 5th Vein screenings.....	Chicago.....	1.80	1.15	1.15
Pool 1 (Navy Standard).....	New York.....	2.65	3.05	2.90	Mt. Olive lump.....	St. Louis.....	2.85	2.75	2.75
Pool 1 (Navy Standard).....	Philadelphia.....	2.70	2.90	2.90	Mt. Olive mine run.....	St. Louis.....	2.35	2.15	2.15
Pool 1 (Navy Standard).....	Baltimore.....	2.25	2.30	2.30	Mt. Olive screenings.....	St. Louis.....	1.75	1.40	1.40
Pool 9 (Super. Low Vol.).....	New York.....	2.05	2.55	2.35	Standard lump.....	St. Louis.....	2.50	2.50	2.50
Pool 9 (Super. Low Vol.).....	Philadelphia.....	2.05	2.45	2.45	Standard mine run.....	St. Louis.....	1.80	1.80	1.80
Pool 9 (Super. Low Vol.).....	Baltimore.....	1.85	2.15	2.10	Standard screenings.....	St. Louis.....	1.40	1.15	1.15
Pool 10 (H.Gr.Low Vol.).....	New York.....	1.75	2.30	2.10	West Ky. block.....	Louisville.....	1.85	2.00	1.85
Pool 10 (H.Gr.Low Vol.).....	Philadelphia.....	1.70	2.15	2.15	West Ky. mine run.....	Louisville.....	1.35	1.35	1.35
Pool 10 (H.Gr.Low Vol.).....	Baltimore.....	1.70	1.95	1.85	West Ky. screenings.....	Louisville.....	1.25	.85	.90
Pool 11 (Low Vol.).....	New York.....	1.55	2.10	1.90	West Ky. block.....	Chicago.....	2.00	2.05	2.05
Pool 11 (Low Vol.).....	Philadelphia.....	1.55	1.95	1.95	West Ky. mine run.....	Chicago.....	1.35	1.50	1.50
Pool 11 (Low Vol.).....	Baltimore.....	1.50	1.75	1.75					
High-Volatile, Eastern					South and Southwest				
Pool 54-64 (Gas and St.).....	New York.....	1.50	1.60	1.60	Big Seam lump.....	Birmingham.....	2.60	2.35	2.35
Pool 54-64 (Gas and St.).....	Philadelphia.....	1.45	1.60	1.60	Big Seam mine run.....	Birmingham.....	1.75	1.75	1.75
Pool 54-64 (Gas and St.).....	Baltimore.....	1.65	1.75	1.55	Big Seam (washed).....	Birmingham.....	1.85	2.10	2.10
Pittsburgh se'd gas.....	Pittsburgh.....	2.50	2.65	2.45	S. E. Ky. block.....	Chicago.....	2.35	2.60	2.60
Pittsburgh gas mine run.....	Pittsburgh.....	2.20	2.10	2.10	S. E. Ky. mine run.....	Chicago.....	1.50	1.85	1.85
Pittsburgh mine run (St.).....	Pittsburgh.....	1.95	2.05	2.05	S. E. Ky. block.....	Louisville.....	2.25	2.75	2.60
Pittsburgh slack (Gas).....	Pittsburgh.....	1.30	1.05	1.20	S. E. Ky. mine run.....	Louisville.....	1.35	1.55	1.40
Kanawha lump.....	Columbus.....	2.10	2.25	2.25	S. E. Ky. screenings.....	Louisville.....	1.00	.80	1.00
Kanawha mine run.....	Columbus.....	1.50	1.55	1.55	S. E. Ky. block.....	Cincinnati.....	2.10	2.35	2.25
Kanawha screenings.....	Columbus.....	.55	.60	.60	S. E. Ky. mine run.....	Cincinnati.....	1.35	1.40	1.50
W. Va. lump.....	Cincinnati.....	2.05	2.25	2.25	S. E. Ky. screenings.....	Cincinnati.....	1.10	.85	.75
W. Va. gas mine run.....	Cincinnati.....	1.35	1.50	1.50	Kansas lump.....	Kansas City.....	4.25	4.50	4.50
W. Va. steam mine run.....	Cincinnati.....	1.30	1.30	1.30	Kansas mine run.....	Kansas City.....	3.00	2.85	2.85
W. Va. screenings.....	Cincinnati.....	1.05	.85	.80	Kansas screenings.....	Kansas City.....	2.50	2.40	2.40
Hooking lump.....	Columbus.....	2.35	2.50	2.50					
Hooking mine run.....	Columbus.....	1.50	1.50	1.50					
Hooking screenings.....	Columbus.....	1.10	.90	.95					
Pitta. No. 8 lump.....	Cleveland.....	2.30	2.30	2.30					
Pitta. No. 8 mine run.....	Cleveland.....	1.80	1.85	1.85					
Pitta. No. 8 screenings.....	Cleveland.....	1.40	1.10	1.10					

* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in heavy type; declines in italics.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

Market Quoted		Freight Rates	March 9, 1925		March 1, 1926		March 8, 1926†	
			Independent	Company	Independent	Company	Independent	Company
Broken	New York	\$2.34		\$8.00@9.25	\$9.00@14.50	\$8.25@9.25	\$9.00@11.50	\$8.25@9.25
Broken	Philadelphia	2.39		9.15	9.00@12.50	9.00@9.25	9.00@12.50	9.00@9.25
Egg	New York	2.34	\$8.25@8.75	8.75@9.25	9.25@14.00	8.75@9.25	9.25@11.50	8.75@9.25
Egg	Philadelphia	2.39	8.90@9.25	8.80@9.25	9.25@12.50	9.15@9.25	9.25@12.50	9.15@9.25
Egg	Chicago*	5.06	8.17@8.40	8.08		8.13		8.13
Stove	New York	2.34	8.75@9.25	9.00@9.50	9.60@14.00	9.25@9.50	9.60@11.50	9.25@9.50
Stove	Philadelphia	2.39	9.35@9.90	9.15@9.50	9.60@12.50	9.35@9.50	9.60@12.50	9.35@9.50
Stove	Chicago*	5.06	8.80@9.00	8.53@8.65		8.33@8.58		8.33@8.58
Chestnut	New York	2.34	8.50@9.25	8.75@9.40	9.25@14.00	8.75@9.15	9.25@11.50	8.75@9.15
Chestnut	Philadelphia	2.39	9.25@9.80	9.25@9.40	9.25@12.50	9.00@9.15	9.25@12.50	9.00@9.15
Chestnut	Chicago*	5.06	8.61@9.00	8.40@8.41		8.33@8.53		8.33@8.53
Pea	New York	2.22	4.50@5.50	5.50@6.00	6.50@9.00	6.00@6.35	6.00@8.00	6.00@6.35
Pea	Philadelphia	2.14	5.00@5.75	6.00	6.50@7.50	6.00@6.50	6.50@7.50	6.00@6.50
Pea	Chicago*	4.79	5.36@5.75	5.36@5.95		5.65@5.80		5.65@5.80
Buckwheat No. 1	New York	2.22	2.00@2.75	3.00@3.15	3.00@5.00	3.00@3.50	2.50@3.50	3.00@3.50
Buckwheat No. 1	Philadelphia	2.14	2.25@3.00	3.00	3.00@3.50	3.00	3.00@3.50	3.00
Rice	New York	2.22	1.80@2.25	2.00@2.25	2.25@3.00	2.00@2.25	2.00@2.50	2.00@2.25
Rice	Philadelphia	2.14	1.70@2.25	2.25	2.25	2.25	2.25	2.25
Barley	New York	2.22	1.30@1.50	1.50	1.75@2.50	1.60@1.75	1.50@1.75	1.60@1.75
Barley	Philadelphia	2.14	1.50	1.50	1.75	1.75	1.75	1.75
Birdseye	New York	2.22	1.35@1.60	1.60		2.00		2.00

*Net tons, f.o.b. mines. †Advances over previous week shown in heavy type; declines in italics

Western Kentucky block is \$1.75@2; lump and egg, \$1.50@1.75.

Optimists envisage a dollar minimum on screenings in the near future. Current offerings show western Kentucky at 85c.@1 and eastern Kentucky at 90c.@1.10. Western Kentucky nut and mine-run are \$1.25@1.50, but the upward swing in screenings is expected to boost nut. Eastern Kentucky mine-run is \$1.35@1.50.

The contract outlook is still very uncertain. Many buyers think they will be safe in playing the spot market; some sellers have no desire to renew business on the same basis in effect in 1925-26. In the meantime, the volume of steam tonnage moving is the best feature of the market.

Weather Helps Northwest

King Winter came to the aid of the docks at the Head of the Lakes last week and lightened the fears of operators who were beginning to view their piles of domestic coal with misgivings. Under the stimulus of weather demand, shipments were increased to dock-consuming territory. Prices, particularly upon smokeless coals, recovered from a dragginess which had threatened reductions. Progressive improvement is reported in industrial demand and the docks again are edging Illinois and Indiana out of some business in the Twin Cities. Stocks on the docks are estimated at 3,500,000 tons.

The weather also toned up drooping domestic trade at St. Paul and Minneapolis. Some retailers have started to advertise all-rail anthracite for sale. Little response is made to pleas for renewals of steam contracts. Spot prices on industrial coals are heavy. Anthracite is coming into Milwaukee in increasing quantities and is readily absorbed by eager consumers. Retail prices are: Stove, \$16.80; nut, \$16.65; pea, \$14.25; buckwheat, \$11, curb or chute delivery.

Kansas operators are marking time, awaiting the official demise of the coal season. Mines are averaging two days a week. The slowing down of production has created a growing scarcity in screenings. Arkansas operations are at a low ebb. Steady curtailment is the rule in Colorado as domestic demand dwindles. This has cut down the number of "no bills" and strengthened the position of steam sizes. Prices are unchanged. Utah markets are at the mercy of the vagaries of the thermometer. Slack is firm at \$1.50, although the immediate demand is not large.

Weather Flurry Relieves Cincinnati

A cold-weather flurry brought relief to the Cincinnati trade last week. It enabled West Virginia producers to get rid of considerable tonnage on wheels at the mines, but resulted in no appreciation in price levels. As a matter of fact, operators still are feeling their way on the price question. For example, there is a spread of 50c. in smokeless circulars on the larger screened sizes and the spot-market range, \$3.75@4.25, is 25c. under circular quotations. Mine-run has weakened to \$2@2.25 and slack is up to \$1.10@1.50, with the bulk of the tonnage moving at \$1.25.

High-volatile prices on prepared sizes have been fairly well maintained. Quotations on mine-run and slack are stronger. Reduced production, of course, is the real support of the market at the present time. Movement through the Cincinnati gateway, according to the latest weekly interchange report of the American Railway Association, decreased 583 loads and the number of empties on their way to the mines decreased 1,219.

The Cincinnati retail situation is unchanged. River business is finding its stride with the approach of spring. Approximately 11,000 tons a week are now coming down the Ohio.

Central Ohio Marks Time

Aside from a slight weather stimulation to domestic trade the past week, the central Ohio market is featureless. Even this stimulus did not result in many orders for shipment. Large industrial consumers are in a comfortable position as regards reserve stocks on hand. The curtailment in production and the closing down of mines incident to the decreased demand for sized coal, however, have pushed quotations on spot screenings to \$1@1.15. Southern Ohio output is now less than 20 per cent of capacity.

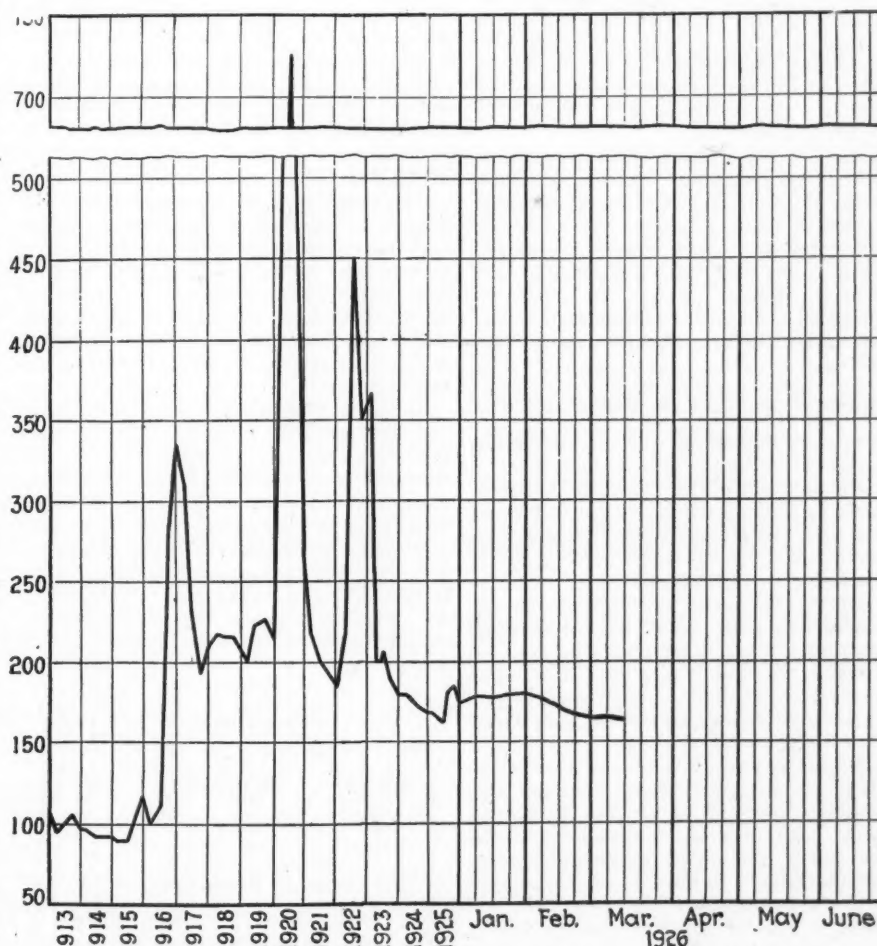
An increase of 15 to 20c. in the price of slack was the outstanding feature of the eastern Ohio market last week. Spot prices on other grades from the No. 8 field were unchanged. Distress coal, however, has diminished and fewer shippers are willing to take the risk of shipping coal on open billing.

During the week ended Feb. 27 the No. 8 field produced 212,000 net tons, or approximately 36 per cent of potential capacity, as compared with 248,000 tons the preceding week and 224,000 tons a year ago.

The effect of the resumption of anthracite mining on central Pennsylvania production is becoming more marked as the weeks go by. During the last week of February daily loadings of coal dropped 400 cars, as compared with a decrease of 200 cars the preceding week. Pool 1 coal is quoted at \$2.80@2.90; pool 71, \$2.55@2.65; pool 9, \$2.35@2.50; pool 10, \$2.25@2.30; pool 11, \$2@2.10; pool 18, \$1.90@2. Lump is \$3.50; egg, \$4; slack, \$1.50.

Weakness Spreading in Pittsburgh

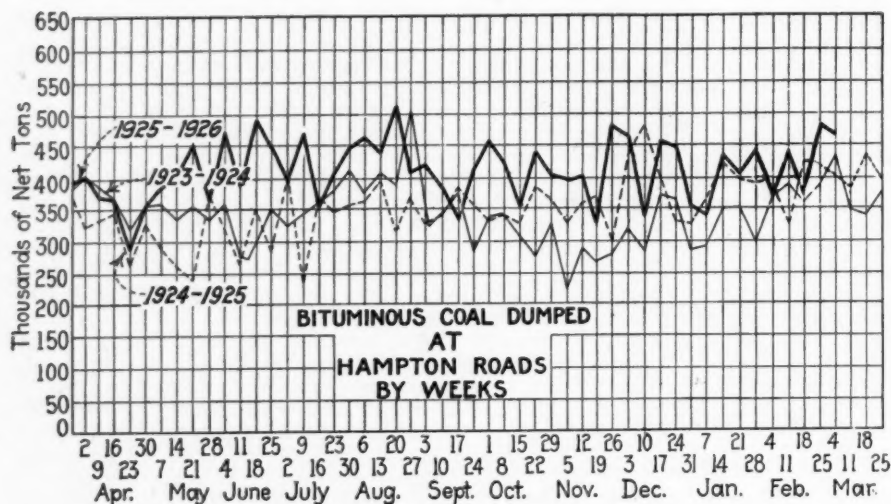
Weakness is spreading over the Pittsburgh district market. Domestic demand is down to the season-end dregs. Industrial and railroad consumption is heavy, but Pittsburgh district mines



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1926				1925	1924
	Mar. 8	Mar. 1	Feb. 22	Feb. 15	Mar. 9	Mar. 10
Index	167	169	170	173	167	181
Weighted average price	\$2.02	\$2.04	\$2.06	\$2.10	\$2.02	\$2.18

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke: 1913-1918," published by the Geological Survey and the War Industries Board.



must fight non-union competition to retain an equitable share of this business. Production is dropping and probably does not exceed 20 per cent of capacity. This is reflected in stronger slack prices, which have advanced 20c. since the anthracite strike settlement.

The gloom characteristic of Buffalo trade opinion has, if anything, taken on a darker tinge. Quotations nominally are unchanged, but business is solicited so actively that it is impossible to present a true price picture. The industrial consumer who insists upon driving a hard bargain does not have to look far to find a seller who can be driven.

There is an unmistakable downward trend to bituminous prices in New England. Coal is piling up at most of the distributing points. Spot demand is moribund. Even those consumers who will use soft coal the coming season are waiting until the situation created by the anthracite strike has cleared up before making new commitments.

Downward Trend in New England

Prepared bituminous is offered freely around \$3 mines. Slack has been a choice morsel for the bargain hunters. There is a weak demand for screened short-haul Pennsylvania bituminous, but this will die as soon as anthracite is moving in normal volume.

There are large accumulations of Pocahontas and New River coal at Hampton Roads which can be had at \$4.40@ \$4.60, but there are few spot buyers. On cars at Boston and Providence quotations have sagged from \$6.50 to \$6 and \$5.85.

The New York bituminous market is "shot to pieces." Spot demand has weakened and prices are on the downgrade. Reports of congestion at the local piers and en route brought more cancellations. Rejection of shipments in the terminals on the plea that the tonnage was of inferior quality added to the confusion. On Long Island alone it was announced that 575 cars of soft coal and 407 cars of coke had been rejected. The railroads are being appealed to to take over such coal.

Some foreign coal was received last week and additional cargoes are on the high seas. Consignees say that they will be able to move that tonnage without trouble. Screened bituminous coal

from Pennsylvania and West Virginia has dropped out of the local picture.

Philadelphia Turns to Contracts

As at New York, the Philadelphia market for bituminous coal for domestic consumption seems to be on its last legs. There is more distress tonnage than shippers like to admit. Bargain-hunting steam coal buyers have absorbed considerable coal of that description. Producers are combing the market in an effort to persuade consumers to enter into contracts for the new year or to renew existing agreements. Although the major producers are holding out for a \$2.65 base, there are others willing to take on tonnage at \$2.20@ \$2.25.

The collapse of the demand for screened coal has forced many mines to close down because they cannot pick up enough industrial business to justify continuing operations. This has strengthened the position of slack coal, which is due for a further increase with the re-entry of cement mills into the market.

Dullness controls the Baltimore bituminous market. Buying of prepared coal is a hand-to-mouth business. Industrial coal moves through normal channels and does not stir up the spot market. Bunker trade, for the most part, has shifted to the Virginia ports. Despite that fact, however, there is no particular snap to the market at Hampton Roads. During the past week an effort was made to clear out old stocks

in anticipation of April 1 contracts. Dumpings for the week ended March 4 dropped to 414,270 gross tons.

No Change at Birmingham

The Birmingham industrial market shows no material change. Spot buying of the lower grades of coal is slow and restricted, but medium and high grade fuels find a fair market. Washed coal is in active demand by the coking ovens. Bunker trade, too, has been healthy. Domestic demand has settled down to a weather proposition.

The gradual absorption of the large stocks of substitutes by consumers and railroads has helped the movement of anthracite to the New York market. As the stocks of soft coal and coke diminished, orders for hard coal increased, but the operators are not pressed to make deliveries. Under these circumstances, some of the independents are finding it difficult to exact the premium prices they asked when mining was first resumed.

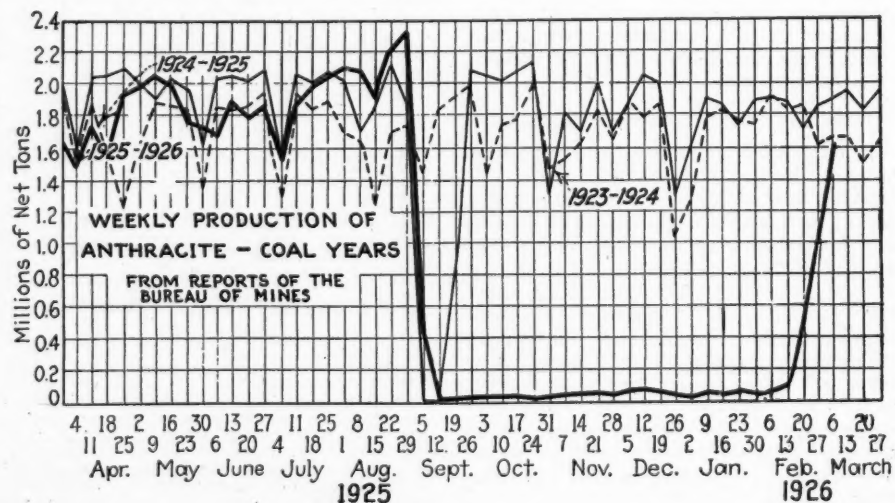
With plenty of soft coal on hand or under contract, some of the producing companies are confronted with accumulations of anthracite steam sizes. Company circulars are the top figures and some sales are made at less. Toward the end of last week barley was offered as low as \$1.35.

Philadelphia Wants Anthracite

Philadelphia retailers are clamoring for anthracite. Independent shippers with premium coal are not deaf to these cries. The percentage of premium tonnage being absorbed is causing some distributors to change their ideas of retail prices. While there are many dealers who are holding egg and nut at \$15.75 and stove at \$16, others are asking \$16.75 and \$17 and in a few cases \$17.50. Pea is \$12 and \$13. Retailers complain that they cannot get enough of this last size. Buckwheat also is in good demand.

In an effort to move some of the substitutes on hand, retailers have insisted that consumers take coke and anthracite in equal quantities. During the cold snap last week many were able to sell this idea to their customers. Retail coke prices are \$4@ \$5 under the yard cost of that fuel.

Baltimore dealers are trying to distribute limited receipts of anthracite in a manner that will take care of the



Car Loadings and Supply

	Cars Loaded		Cars Shortages	
	All Cars	Coal Cars	All Cars	Coal Cars
Week ended Feb. 20, 1926.....	931,743	169,913		
Preceding week.....	917,144	171,903		
Week ended Feb. 21, 1925.....	925,295	165,359		
	Surplus Cars		Car Shortages	
	All Cars	Coal Cars	All Cars	Coal Cars
Feb. 23, 1926.....	227,511	88,629		
Feb. 15, 1926.....	232,031	90,604		
Feb. 22, 1925.....	256,230	113,302		

greatest number of customers. Little independent tonnage is being purchased. Retail prices are on a pre-strike basis.

Buffalo seems to have enough anthracite to meet current pressing demands—too much in fact to suit some distributors loaded up with high-priced coke or bituminous coal. Across the border, Toronto dealers are working at high pressure to take care of anthracite demand and to sell, where possible, a mixture of hard coal and coke. The large domestic anthracite is retailing at \$16; pea is \$13. Coke has been cut to \$15, a reduction of \$2.

Connellsville Abandons Hope

Connellsville has definitely placed the hope that there would be a revival in retail demand for coke in the limbo of forgotten things. The region is now concentrating its coke attention upon metallurgical business. Standard furnace coke is \$3.25@3.50; foundry coke, \$4.50@5. Production has decreased sharply. Some mines are now seeking to sell the raw coal to the gas trade.

Blast furnaces have bought little spot or prompt coke. It is probable, too, that they will postpone negotiating second-quarter contracts until the eleventh hour. Foundries have been fair buyers to cover requirements upon which orders were withheld during the price orgy.

The Connellsville *Courier* reports coke output in the Connellsville and Lower Connellsville regions the week ended Feb. 27 at 103,100 tons from the

furnace ovens and 102,900 tons from the merchant ovens. Compared with the preceding week, furnace oven output decreased 7,600 tons and the output from the merchant ovens dropped off 18,560 tons.

New York Coal Imports

Custom House reports show that imports through the Port of New York during the months of November, December and January last included 180,465 tons of anthracite, 37,431 tons of coke, 5,148 tons of bituminous coal and shale and 20 tons of slack and culm.

Imports by months were:

November—46,342 tons of anthracite, valued at \$478,843, an average cost of \$10.33, and 2 tons of bituminous coal and shale, valued at \$19.

December—83,272 tons of anthracite, valued at \$836,227, an average cost of \$10.04 per ton; 5,146 tons of bituminous coal and shale, valued at \$28,130, an average cost of \$5.46; 20 tons of slack and culm, valued at \$138, an average cost of \$6.90, and 33,342 tons of coke, valued at \$216,143, an average of \$6.48 per ton.

January—50,851 tons of anthracite, valued at \$447,080, an average cost of \$8.77 per ton, and 4,089 tons of coke, valued at \$37,922, an average of \$9.27 per ton.

New England Fuel Committee May Be Permanent

The New England Governors' Fuel Committee, according to statement by Vice-Chairman Eugene C. Haultman, will function until June 1, at least, and it is probable that arrangements will be made whereby the committee will continue as a permanent body. The committee believes it has done good work for New England and should continue to function as a protection, if nothing more, to the people of that section against the possibility of future fuel troubles.

Coke Output Sets New Record In January

Output of byproduct coke in the United States during January, according to reports by operators to the U. S. Bureau of Mines totaled 3,804,000 net tons, an increase of 44,000 tons, or 11.7 per cent, compared with the preceding month. The coke plants operated at about 92 per cent of capacity.

Beehive coke production continued to increase during January, the total being estimated at 1,381,000 net tons, an increase of 74,000 tons, or 5.7 per cent, compared with December.

Monthly Output of Byproduct and Beehive Coke in the United States.*

(In Thousands of Net Tons)

	By-product Coke	Beehive Coke	Total
January, 1926.....	3,804	1,381	5,185
December, 1925.....	3,760	1,307	5,067
November, 1925.....	3,557	1,213	4,770
October, 1925.....	3,402	1,006	4,408
1925 monthly average..	3,332	893	4,225
1924 monthly average..	2,833	806	3,639
1923 monthly average..	3,133	1,615	4,748

*Excludes screenings and breeze.

Coal consumed in both beehive and byproduct coke plants in January was 7,644,000 tons, 5,466,000 tons being consumed at byproduct plants, and 2,178,000 tons at beehive plants.

Estimated Monthly Consumption of Coal in Manufacture of Coke

(In Thousands of Net Tons)

	Consumed in By-product Ovens	Consumed in Beehive Ovens	Total Coal Consumed
January, 1926.....	5,466	2,178	7,644
December, 1925.....	5,403	2,062	7,465
November, 1925.....	5,111	1,913	7,024
October, 1925.....	4,888	1,587	6,475
1925 monthly average..	4,787	1,371	6,158
1924 monthly average..	4,060	1,272	5,332
1923 monthly average..	4,523	2,507	7,030

Of the total output of byproduct coke during January, 3,153,000 tons, or 82.9 per cent, was made in plants associated with iron furnaces, and 651,000 tons, or 17.1 per cent, was made at merchant or other plants.

Coal Produced in Utah, Virginia and Washington in 1924

(Exclusive of Product of Wagon Mines)

State and County	Loaded at Mines for Shipment	Net Tons			Total Quantity	Value		Average per Ton	Number of Employees				Average Number of Days Worked a	Average Tons per Man per day
		Sold to Local Trade and Used by Employees	Used at Mines for Steam and Heat	Made Into Coke at Mines		Total	Total		Underground Miners b	All Others	Surface	Total		
Utah														
Carbon.....	3,710,507	28,515	52,779	268,930	4,060,731	\$10,867,000	\$2.68	2,162	918	863	3,943	186	5.33	
Emery.....	274,727	8,351	399	.....	283,477	814,000	2.87	129	51	49	229	135	9.18
Uintah.....	.....	4,184	.....	.....	4,184	17,000	4.06	7	3	2	12	120	2.92
Other counties c.....	122,027	10,350	7,388	.....	139,765	359,000	2.57	71	51	24	146	146	6.54
Total.....	4,107,261	51,400	60,566	268,930	4,488,157	\$12,057,000	\$2.69	2,369	1,023	938	4,330	182	5.70	
Virginia														
Dickenson.....	783,552	6,111	4,574	.....	794,237	\$1,583,000	\$1.99	373	271	184	828	224	4.27
Lee.....	1,125,880	11,493	2,729	.....	1,140,102	2,150,000	1.89	876	379	314	1,569	201	3.61
Montgomery.....	39,500	532	721	.....	40,753	132,000	3.24	78	28	65	171	166	1.43
Russell.....	1,569,607	27,718	4,748	.....	1,602,073	3,224,000	2.01	829	626	377	1,832	216	4.04
Tazewell.....	1,775,075	19,019	7,336	.....	1,801,430	3,629,000	2.01	782	845	408	2,035	212	4.17
Wise.....	4,320,695	101,721	25,243	716,821	5,164,420	10,543,000	2.04	3,107	2,050	854	6,011	243	3.54	
Other counties d.....	141,913	1,936	6,600	.....	150,449	562,000	3.74	86	56	91	233	221	2.93
Total.....	9,756,162	168,530	51,951	716,821	10,693,464	\$21,823,000	\$2.04	6,131	4,233	2,293	12,679	226	3.73	
Washington														
King.....	571,953	25,804	13,536	600	611,893	\$2,062,000	\$3.37	424	280	155	859	236	3.02	
Kittitas.....	1,005,919	19,643	31,038	.....	1,056,600	3,893,000	3.68	1,098	300	240	1,638	163	3.95
Lewis.....	81,850	20,597	5,188	.....	107,635	298,000	2.77	79	46	39	164	166	3.95
Pierce.....	321,749	3,857	13,229	48,739	387,574	1,838,000	4.74	326	287	170	783	234	2.12	
Other counties e.....	460,588	22,465	6,912	.....	489,965	1,598,000	3.26	265	69	80	414	237	4.99
Total.....	2,442,059	92,366	69,903	49,339	2,653,667	\$9,689,000	\$3.65	2,192	982	684	3,858	202	3.41	

a Note that figures of men employed and days worked do not include mines that operated in 1923 but were idle the entire year 1924; they do include many mines operated for a short time only in 1924. The number of active mines of commercial size in Utah was 37 in 1923 and 39 in 1924; in Virginia, 168 in 1923 and 115 in 1924; in Washington, 56 in 1923 and 58 in 1924.

b Includes also loaders and shotfired.

c Grand, Iron, San Juan, Sevier and Summit.

d Pulaski and Scott.

e Cowlitz, Thurston and Whatcom.

Statistics compiled by U. S. Bureau of Mines.

Foreign Market And Export News

Shipping Delays Upset Welsh Coal Movement; Tyne Spot Trade Slow

Though the general aspect of the coal trade in South Wales is promising, and there is enough business in hand to ensure a fair degree of activity for the next two months, the position for immediate shipment is less favorable on account of shipping irregularities, with the consequent arrears in deliveries. Where the tonnage is that should be ready in Welsh ports nobody seems to know.

A serious handicap has been the sharp rise in freights for South America and the Mediterranean, representing 6s. in the former case and around 2s. 6d. per ton in the latter. This rise has meant serious loss to many exporters who accepted cheap c.i.f. contracts some months ago.

As a rule, the collieries, are well booked to the end of April, and the output in Wales has risen from around 700,000 tons per week last September to over 1,000,000 tons. In addition to this there is the possibility of the Cambrian Collieries reopening. These mines were closed in August, 1924, when they employed around 3,500 men. Besides the 200,000 tons for the Paris, Lyons & Mediterranean Ry., reported last week, orders have been booked for 25,000 tons for the Portuguese Rys. and 20,000 tons for the Spanish Andalusian Rys.

The market at Newcastle is irregular due largely to shipping delays, higher prices and higher freights. In consequence there is a fair quantity of coal on the market for ready sale at less than current prices. Most of the collieries are well booked into March.

Output by British collieries during the week ended Feb. 20, according to a special cable to *Coal Age*, totaled 5,420,000 gross tons, compared with 5,400,000 tons in the preceding week.

Industrial Demand Rules Belgium

Demand is undoubtedly better for Belgian industrial coals, although stocks are still available, reports Brussels under date of Feb. 18. French coal, however, which has increased about 15 fr., is less a factor than ever and the same is true of German free coal. Domestic trade, however, is not very

large, because of milder weather, but there are no surplus stocks available.

It is declared that the coal fields producing lean and anthracitic sizes alone make money, all the others being in deficit.

The Coke Syndicate quotes 125 fr. nominally. Indemnity coke is 120 fr., but it is possible to get fuel at 115 fr. and even less.

French Domestic Demand Eases; General Outlook Good

Paris, France, Feb. 18.—The market for French coal remains satisfactory; there is more easiness, however, in domestic consumption, due to milder weather. Scarcity of flaming coal continues.

Russian anthracite is hard to move because it is not successful in the stoves used in flats (salamanders). Donetz cobbles, however, give satisfaction in central heating plants, but prices are considered too high in comparison to those of Welsh anthracite.

Receipts of Ruhr coke have been on the increase, but it is reported that with March deliveries of indemnity coke will be reduced in volume and prices increased over 10 fr. French metallurgical plants will have their allotment of coking smalls cut from 120,000 to 90,000 tons per month. These changes are attributed to a depletion of funds at the disposal of the Agent of Payments (Dawes plan).

In 1925 France imported 18,296,419 metric tons of coal, as compared with 25,106,584 tons in 1924. The 1924 figures, however, included 5,214,030 tons from the Sarre, now covered in French production. In 1925 France exported 4,606,443 tons of coal, as against 2,245,098 tons in 1924. Exports in 1924 did not include shipments from the Sarre. What part of 1925 exports came from the Sarre cannot be determined from the published figures, but it probably approximated 2,300,000 tons.

If we add to the output of 1925 (48,033,564 tons) the amount of the imports, and if we deduct the exports, we arrive at a total of 61,724,000 tons, which represents the tonnage put at the disposal of consumers in the past year. This does not include the stocks existing on Dec. 31, 1924, nor the Sarre imports. By a simple compari-

son we may say that in 1924 the consumption fixed in this way had come to 67,816,000 tons.

Polish-Italian Contract Signed

The Polish Ministry of Industry and Commerce has announced the conclusion of a contract with Italy by which Poland will export 500,000 metric tons of lump coal to that country annually, payment to be cash against delivery. It is not known whether all or only half of this amount will be used for the Italian railways. Poland, in return, is to give special concessions for the importation of Italian oranges upon which there have been special restrictions heretofore.

Export Clearances, Week Ended March 4, 1926

FROM HAMPTON ROADS		Tons
For Trinidad:		
Br. Str. Baron Douglas, for Port of Spain		3,345
For Nova Scotia:		
Br. Str. Sambre, for Halifax		989
For Brazil:		
Br. Str. Selson Hall, for Rio de Janeiro		8,333
Br. Str. Dumfries, for Rio de Janeiro		4,698
Braz. Str. Aracaju, for Rio de Janeiro		1,786
Br. Str. Bradclyde, for Pernambuco		7,346
For Cuba:		
Br. Str. Baron Sempill, for Havana		3,300
For St. Lucia:		
Br. Str. Baron Garioch, for Port Castries		3,447
For Jamaica:		
Nor. Str. Odland 1, for Kingston		1,007
For Dominican Republic:		
Nor. Str. Andres, for San Pedro		1,029
For Bermuda:		
Br. Str. Glenpark, for St. Georges		2,529
For French West Indies:		
Nor. Str. Bur, for Fort de France		6,179
For Mexico:		
Nor. Str. Navarra, for Puerto		1,999

Hampton Roads Coal Dumpings* (In Gross Tons)

	Feb. 25	Mar. 4
N.W. Piers, Lamberts Pt.	151,884	170,257
Tons dumped for week		
Virginian Piers, Sewalls Pt.	117,164	113,135
Tons dumped for week		
C.O. Piers, Newport News	162,932	130,876
Tons dumped for week		

*Data on cars on hand, tonnage on hand and tonnage waiting withheld due to snippers' protest.

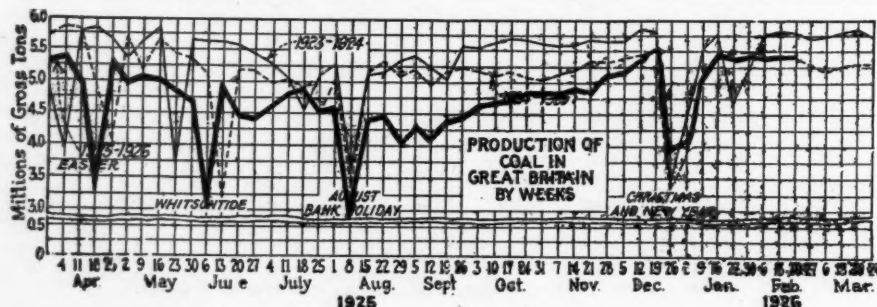
Pier and Bunker Prices, Gross Tons

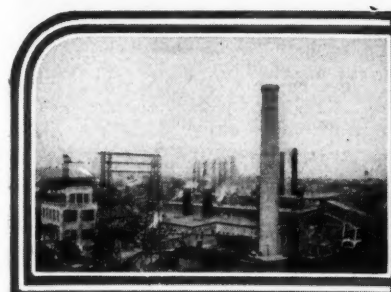
PIERS		Feb. 27	March 6†
Pool 1, New York	\$6.00@	\$6.25	\$5.75@ \$6.00
Pool 9, New York	5.40@	5.70	5.30@ 5.55
Pool 10, New York	5.25@	5.50	5.00@ 5.25
Pool 11, New York	4.85@	5.25	4.50@ 4.80
Pool 9, Philadelphia	5.30@	5.55	5.10@ 5.40
Pool 10, Philadelphia	5.10@	5.25	4.95@ 5.15
Pool 11, Philadelphia	4.75@	5.00	4.60@ 4.80
Pool 1, Hamp. Roads	4.50@	4.65	4.50@ 4.60
Pool 2, Hamp. Roads	4.20@	4.30	4.30@ 4.35
Pools 5-6-7, Hamp. Rds.		4.10	4.00@ 4.10
BUNKERS		Feb. 27	March 6†
Pool 1, New York	\$6.25@	\$6.50	\$6.00@ \$6.25
Pool 9, New York	5.65@	5.95	5.55@ 5.80
Pool 10, New York	5.50@	5.75	5.25@ 5.50
Pool 11, New York	5.10@	5.50	4.75@ 5.05
Pool 9, Philadelphia	5.55@	5.80	5.35@ 5.65
Pool 10, Philadelphia	5.35@	5.60	5.20@ 5.40
Pool 11, Philadelphia	5.00@	5.25	4.85@ 5.05
Pool 1, Hamp. Roads		4.65	4.60
Pool 2, Hamp. Roads		4.30	4.35
Pools 5-6-7, Hamp. Rds.		4.15	4.10

Current Quotations, British Coal, f.o.b. Port, Gross Tons

Quotations by Cable to Coal Age		Feb. 27	March 6†
Cardiff:			
Admiralty, large	23s.	@ 24s.	23s. @ 24s.
Steam smalls	12s.	@ 13s.	12s.
Newcastle:			
Best steams	16s.	@ 16s. 6d.	15s. 6d. @ 16s.
Best gas	19s.		17s. 6d.
Best bunkers	17s.		16s. 9d.

†Advances over previous week shown in heavy type; declines in italics.





News Items From Field and Trade



ALABAMA

Preparations are being made by Moss & McCormack to sink two slopes at their operations near Carbon Hill, Walker County, where they are developing extensive mining operations. These slopes will be about 850 ft. deep and will tap the Jagger seam of coal. The company is now producing coal from the Corona seam through six drift openings. A large mining camp is nearing completion and tippie buildings, washery and preparation machinery of the most modern type have been erected and placed in operation. A mechanical loader has been installed in one of the openings and the company plans to add a number of additional machines of this kind, if they prove satisfactory. The mines are located on a spur which taps the main line of the Frisco railroad at Carbon Hill. Main offices of the company are in Birmingham.

INDIANA

The Knox Consolidated Coal Co., Indianapolis, is considering the rebuilding of the power house at its Bruceville mine, near Bicknell, and of the tippie at Indian Creek mine. The Bruceville power house was destroyed by fire Jan. 13, with a loss of \$25,000, and the Indian Creek tippie was partly destroyed by fire Jan. 2, causing a loss of approximately \$65,000.

The Prior Coal Co., Marion, has filed a final certificate of dissolution.

The LeNoir Coal Co., Bloomfield, has filed a final certificate of dissolution.

ILLINOIS

The Illinois Miners' Examining Board will hold sessions this month as follows: Duquoin, Miners' hall, March 12; Centralia, Miners' Hall, March 13; Staunton, Labor Temple, March 15; Springfield, State House, March 16; Danville, court house, March 17; Farmington, Moose Hall, March 18; Peoria, court house, March 19, and Lincoln, City Hall, March 20.

A loss of almost 50 per cent of the coal in Illinois results from present methods of coal mining, according to a report of the State Geological Survey, located at the University of Illinois. The survey covers eleven fields in twenty-seven counties, representing nearly the entire output of the state. In the mining of 69,785,000 tons of coal, the report states, 67,045,000 tons was lost. Pillars account for most of the loss, the average being 39 per cent,

but investigation showed, the report says, that 32 per cent of the loss was avoidable.

Plans are being made for the opening of the old Tazewell County coal mine, at Pekin.

KANSAS

Incomplete reports from Kansas coal mines, James A. Sherwood, state mine inspector, announced March 1, showed a production of 4,705,820 tons. Six shaft mines and three shovel mines had not yet sent in complete reports to the inspector's office. The total production from all mines in 1924 was 4,491,069 tons. The nine mines yet to report on last year's business are expected to raise the total to the neighborhood of five million tons.

KENTUCKY

An involuntary petition in bankruptcy was filed last week in the U. S. District Court at Louisville against the Rockport Coal Co., operator of two Ohio County mines located at Rockport and Centertown. Assets of the company were estimated by the attorneys at \$100,000 and liabilities were said to be \$125,000 to \$150,000. It was charged that in addition to the alleged fact of its insolvency the company made preferred payments to certain creditors. The company's coal mines, it is said, have never resumed operations on their original scale since the 1924 strike. The firm is incorporated in Kentucky with H. L. Tucker, Central City, as president and R. C. Reid, Rockport, as secretary.

The Harlan-Jellico Coal Co., Louisville, operating a mine in Harlan County, has changed its name to the Dougherty Coal Co. The company is owned by the Dougherty interests of Louisville.

A bill has been passed by the lower house of the Kentucky Legislature to create a central purchasing department, for state needs of every kind. Coal, instead of being purchased by several buyers, would all go through one buying office. It is an administration bill and is almost certain to become a law.

NEW YORK

Edward W. G. Borer, Philadelphia, was elected a director of the By-Products Coke Corp. at the annual meeting in Syracuse, Feb. 23, after a vote of stockholders increasing the number of directors from 14 to 15. C. D. Caldwell, president, announced that appli-

cation will be made to list stock of the company on the New York Stock Exchange. Stockholders voted to reduce the number of preferred shares from 50,000, \$100 par, to 20,000, \$100 par, and increase the number of common shares from 100,000, \$100 par value, to 200,000, no par. It will be distributed to present owners on a two to one basis. Principal offices of the company were transferred from Syracuse to New York City.

MASSACHUSETTS

Deliveries of bituminous coal by retail dealers in Massachusetts during January were reported as 369,621 tons, which is an increase of over 60,000 tons over deliveries in the preceding month. Coke deliveries increased from 46,665 tons in December to 66,781 tons in January. Deliveries of foreign and domestic anthracite and semi-anthracite totaled 83,710 tons in January, which makes the total amount of anthracite delivered this winter up to Feb. 1 3,802,000 tons, as compared with the total deliveries last year (April 1, 1924, to March 31, 1925) of 5,115,717 tons.

MONTANA

The Northern Pacific R.R. reports that a saving of \$700,000 was effected in 1925 through the use of coal from the open pit mines in the Rosebut strip of Montana.

PENNSYLVANIA

Officials of the St. Clair colliery announce that operations will be resumed in the course of a few days. This mine was one of the few that suffered during the long anthracite strike through a walkout by maintenance men. The interior of the mine is now being put in readiness for work. The breaker has a normal production of 1,000 tons a day when going at full speed.

The Consumers Coal Co., Harmarville, has reopened its mine after being closed for six weeks on account of obstruction of navigation in the Allegheny River by ice. About 450 men have returned to work. The coal of this mine is shipped largely to Follansbee, W. Va., for conversion into coke.

Since the settlement of the anthracite strike the following coke ovens have been blown out in the Connellsville field: Washington Coal & Coke Co., Star Junction, 100; A. M. Byers Co., Orient plant, operated by Hillman Coal & Coke Co., 160; all ovens at the Republic plant of the Republic Iron & Steel Co.; all the ovens at the several

plants of the Corrado interests; part of the ovens at the Tower Hill plants of the Hillman Coal & Coke Co.; Snowdon Coke Co., 200; Union Connellsville Coal & Coke Co., closed down entirely; all ovens of the Footedale plant of the H. C. Frick Coke Co.

The washery of the Pittston Coal Co., near Pittston, was destroyed by fire Feb. 21. It had been idle during the anthracite strike, and workmen were preparing it for a resumption of operations when the fire occurred. The owners announce that the structure will be rebuilt.

A step toward segregation of the coal properties from other holdings of the Lehigh Coal & Navigation Co., was taken Feb. 23 at the annual stockholders' meeting, when a resolution was adopted providing for the appointment of a committee of three stockholders and three members of the board of managers to study the company's financial structure and report recommendations. The resolution asserted that the recent suspension of anthracite mining had resulted in bringing to public notice "so-called earning figures" of the large producers, and added: "Said figures as applied to the Lehigh Coal & Navigation Co. are misleading, as the actual earnings and the total net assets, apart from the coal lands and improvements, are far in excess of earnings and actual value of said coal lands and improvements." Samuel D. Warriner was re-elected president of the company.

The Pittsburgh Coal Co. reports production for the week ended February 27 by its eight mines in western Pennsylvania operating on the 1917 scale was 33,304 tons, a new high record. Banning No. 2 mine, which has been operating since last August, set up a new record with 7,732 tons.

The Hudson Coal Co.'s new breaker at Olyphant will supplant the Eddy Creek, Miles Slope and Olyphant breakers. The new coal-preparing plant will centralize the Mid-Valley output of the Hudson mines. It will be electrically equipped throughout and embody modern flotation processes for better preparation of the coal.

Anthony R. Panne, of Old Forge, president of the Old Forge Colliery local of the Pennsylvania Coal Co. and for years touted by the union as a radical, has been named a field worker and organizer of District 1, United Mine Workers. Rinaldo Cappellini, president of District 1, announced the appointment.

Much protest is heard throughout the anthracite region because of the delay on the part of Governor Gifford Pinchot in appointing seven anthracite mine inspectors to fill vacancies caused by death or resignation. Some of the vacancies have existed for months. Three bituminous mine inspectors also have to be appointed. In the list of ten vacancies one has existed for two years.

Coal interests in the Pittsburgh district have been successful in having the government revise its plans in connection with the Youghiogheny River basin. Another survey will be made with a view to development. A recent report by Major Daly, in charge of the U. S. Engineers in the Pittsburgh dis-

trict, disapproved the project for development, which occasioned emphatic protests by the Pittsburgh Coal Co. and others, who declared there were millions of tons of coal in the river basin that will be needed in this district shortly, and the only economical means of getting it out will be via river.

For a consideration of \$1,600,000, the Wheeling Coal Co. sold to the Redstone Coal & Coke Co. all its rights of way, titles, privileges, rents, liberties, property and 987 acres of virgin coal lands, situated in Luzerne township, Pa., according to a deed filed Feb. 25. The Wheeling Coal Co. is a Wheeling (W. Va.) concern, while the Redstone Coal & Coke Co. is a Pittsburgh corporation. The transaction was concluded by Isaac M. Scott, president of the Wheeling company, and E. T. Weir, president of the Redstone concern.

State foresters and foresters in the employ of the Philadelphia & Reading Coal & Iron Co. have decided to work together to accomplish the reforestation of the Pottsville region. A large number of trees will be planted this year, and with the watchmen keeping vigilant outlook on high towers which have been provided, it is believed fires can be promptly conquered. Over 350,000 trees already planted are in a flourishing condition.

Pine Forest mine, in the Pottsville region, which was idle for more than two years, has resumed operations, with seventy-five men at work. John Boyd has been placed in charge of the plant.

When operations were resumed in the anthracite field after the long strike coal was hoisted from the old Woodside mine, near Freeland, for the first time in 38 years. This mine was abandoned by Cox Bros. & Co. back in 1888, when it became flooded. It remained in that condition until last summer, when the Wolfe Coal Co., a new organization, took possession of the property and had the water pumped from the workings. Nearly 100 cars of coal have been taken

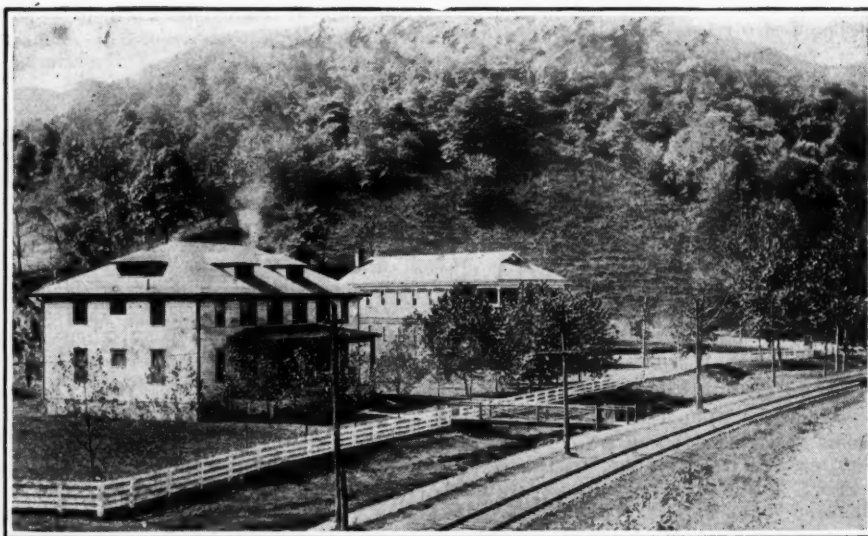
from the mine since the strike and officials say that the tonnage will be increased later. The coal is being prepared for market at a Lehigh Valley Coal Co. breaker at Drifton.

One new breaker was finished and another almost ready for operation when the anthracite miners recently resumed work after their long strike. The new all steel and electrically equipped plant of the Coleraine Colliery Co., near Hazleton, was tested two days after the strike ended and was accepted. It is intended to prepare about 400 tons of coal a day at this plant for the present, but later the tonnage will be doubled. The breaker cost \$100,000. The new breaker of Madeira, Hill & Co., at Marion Heights, is almost ready for work. Three shifts are at work on the structure. Work on this plant was halted during the strike because of a dispute between the union and employers as to the loading of coal.

UTAH

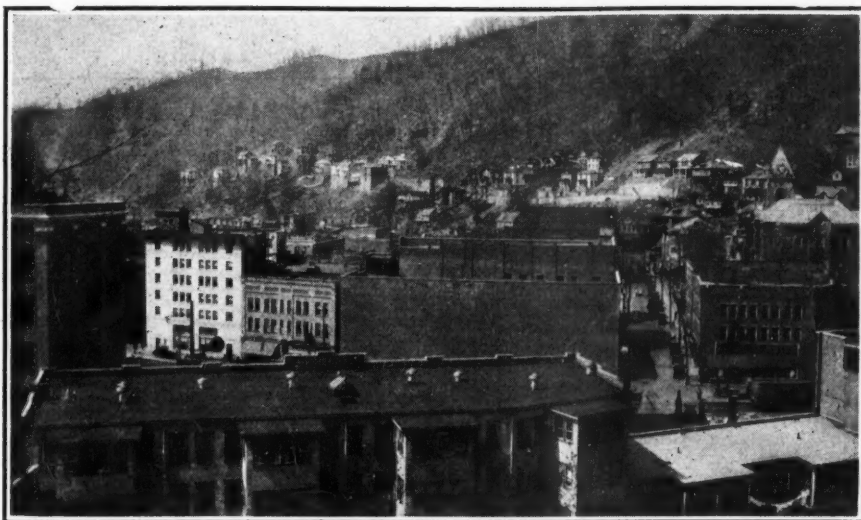
The Salt Lake County Commissioners have asked for new coal bids after rejecting three. The lowest price offered on slack was \$3.40. Because the city authorities were getting this coal at \$3.20 it was decided to advertise for more bids. It was understood by the Commissioners that a number of bids had miscarried.

Those seeking to place the Great Western Coal Mines Co. in the hands of a receiver were severely scored last week by District Judge L. B. Wight, of Salt Lake City. Counsel for the petitioner is said to have sought the receivership without acquainting the coal company officials with the fact. It was declared that none of the creditors outside of this petitioner wanted to place the company in a receiver's hands. It is stated that the defendant company has considerable property in Carbon County, and is now commencing the shipment of coal after surmounting many difficulties.



Consolidation Coal Co. Provides Recreation Center at Van Lear, Ky.

The employees of the Millers Creek Division of the Consolidation Coal Co. have a new club house and a modern recreation building located within a few hundred feet of the company's office building and store at Van Lear, Ky. The club house (left) has strictly modern plumbing, five bathrooms, showers, and is heated by a steam controlled vacuum vapor system.



A Busy Mining Community in the Hills of West Virginia

That mining is on a profitable basis in this region is evidenced by this view of the mining town of Welch, W. Va. Substantial business buildings comprise the central part of town while the residential section, as may be seen in the background of the picture, extends well up the hillside.

VIRGINIA

Negotiations have been closed for the purchase of the Gunton Park properties of the Smokeless Coal Corp., of Pulaski, by the Gunton Park Anthracite Collieries Corp., a new company headed by former Senator L. Heisler Ball, of Delaware, the principal stockholders being Delawareans. The property, located seven miles west of Pulaski, comprises 1,200 acres. At a depth of 650 ft. a 7-ft. seam has been located in connection with three separate veins. Fifty cars of coal have been shipped to Northern markets during the preliminary developments. Proceeds from the sale of \$600,000 7 per cent bonds will be expended in equipping and electrifying the mines and building a standard gage connection to the Norfolk & Western, one mile distant. It is contemplated having the mines equipped and producing coal by April 1.

WEST VIRGINIA

The capital stock of the Glogora Coal Co. has been increased from \$500,000 to \$1,000,000; that of the Blue Ridge Coal Corporation from \$200,000 to \$400,000; of the Export Coal Co. from \$150,000 to \$300,000; of the Hubball Guyan Coal Co. from \$25,000 to \$100,000.

The Grey Eagle Mining Co., organized under the laws of the State of Delaware, in which Thomas A. Shewey, of Grey Eagle, and others are interested, has been authorized to transact business in West Virginia.

The Crown Coal Co. has purchased from the Whyel Coal & Coke Co., Harry Whyel and the P. V. & K. Coal Co. 2,200 acres of coal land in the Arnettsville section. The deal involves a consideration of approximately \$1,000,000, it is stated.

Charles E. Hawker and Cecil H. Humphrey, of Fairmont, have obtained a controlling interest in the Rosedale Coal Co. operating in the Monongalia field and Mr. Hawker has been elected

president and Mr. Humphrey general manager. The new board of directors includes Edward G. Donley and A. J. Garlow, of Morgantown, and Charles F. Clement, of Philadelphia. The company was formerly owned by John L. Hatfield, W. S. John, Mrs. Asa Sterling and Isaac Van Voorhis. Under the reorganization the company will be closely affiliated with the Winslow Coal Co., of Pittsburgh, which conducts a large brokerage business in the soft coal area. An increase in capital stock has been authorized to build additional houses for miners and to erect a new tippie in order to increase production from 2,500 to 4,500 tons per day.

One of the largest intensified safety drives in southern West Virginia will be staged in the Logan field on March 21, when safety meetings will be held at Braeholm, Amherstdale and Lundale. Robert M. Lambie, chief of the state Department of Mines, will address the meetings.

Stockholders of the Crystal Block & Coke Co. have elected directors for the current year and the Crystal Block Mining Co., a subsidiary concern, has chosen practically the same directors. The only change in the directorate of the Crystal Block Coal Co. was in the election of L. A. Osborn in the place of Howard N. Eavenson. The board as elected includes Col. Edward O'Toole, Dr. R. V. Shanklin, J. M. Tulley, J. H. Barker, E. O'Toole, Jr., L. A. Osborn and L. E. Wood. On the board of the mining company are Colonel O'Toole, Dr. R. V. Shanklin, J. H. Barker, L. E. Wood and Howard N. Eavenson. The Crystal Block Mining Co. recently declared a 50 per cent cash dividend.

Although strenuously opposed by representatives of its stockholders, sale of the Lewis mine of the Hudson Coal Co. to the Wentz Corporation, of Philadelphia, for \$340,000, was confirmed on Feb. 18 by Judge Birk S. Stathers of the Circuit Court of Harrison County. The mine, located on the Baltimore & Ohio R.R. near Wolf Summit, in Harri-

son County, was offered for sale on Feb. 6 and the Wentz Corporation was the only bidder. When the sale came up for confirmation on Feb. 15, stockholders of the Hudson company raised objections to the confirmation on the ground that the mine had been appraised at \$1,000,000. Since last May the mine has been operated under the receivership of P. H. Knode, of Philadelphia, employing about 250 men.

Since installing new equipment, including shaker screens, loading booms, etc., costing \$25,000 at the Vanbail mine, the Vanbail Coal Co. has been able to increase its capacity from 150 to 200 tons a day.

A safety meeting was held Saturday evening, Feb. 27, by employees of the Pocahontas Fuel Co. at Jenkinjones, McDowell County. The chief addresses were by Thomas Stockdale and William D. Lee, district state mining inspectors. A. V. Spole, director of safety of the Pocahontas company, was in charge.

Members of the senior class in mining engineering in West Virginia University at Morgantown, were given a thorough and practical course in mine rescue and first aid training. R. M. Lambie, chief of the state department of mines, will be in charge. It is planned to give the training in a coal mine in the Scott's Run section. The students entered the mines with self-contained breathing apparatus, flame safety lamps, all-service gas masks. Burrell methane indicator, carbon monoxide and various approved equipment.

The Blue Ridge Coal Corporation of Charleston, is erecting a new tippie and equipment of shaker screens and loading booms at Brush Creek, Boone county. A three-track tippie is also being erected at No. 2 mine, and it is being equipped with shaker screens and loading booms. A year ago the company erected a new tippie and obtained shaker screens and loading booms at mine No. 3. The work of erecting the plants is in charge of J. J. Ross, the president of the company.

McComas, in the Matoaka district, has the largest mining extension school in the state, according to officials of West Virginia University. Fifty-seven men are enrolled in the McComas class. Coal company officials are urging the men to attend the school and they report that there is a marked improvement in efficiency along mining lines.

P. D. Costello, superintendent at the Jamison No. 8 mine of the Jamison Coal & Coke Co., states that a contract has been given for boring holes in front of the workings at No. 8 mine, in which vacuum pumps will be installed to draw the gas from coal to be mined. This safety measure was determined upon following the explosion in Jamison No. 7 mine last year. The company also is installing air-driven puncher machifres in No. 8 mine to replace the electric driven cutting machines, as an additional safety measure. The installation will be completed within a few weeks, it is stated. Since the explosion in No. 8 mine, Jan. 14, almost the entire working has been dusted with limestone.

Personal

There is an opening on the editorial staff of *Coal Age*. Please address J. E. Spurr, *Coal Age*, 10th Ave. and 36th St., New York, giving such information as would be of interest.

J. W. Powell, formerly a consulting mining engineer of Welch and Charleston, W. Va., who is at present chief mining engineer of the Autonomous Industrial Colony Kusbas, Kemerovo, Siberia, arrived in Welch last week. Mr. Powell is on vacation for three months and expects to return to Siberia in May or June. While in the United States he will investigate coal-cleaning equipment, coal-cutting and conveying machinery, storage-battery locomotives, mine cars and haulage equipment and coal- and rock-drilling machines and other coal-mining equipment. Mr. Powell reports great progress in the development of coal mines in the Kuznets coal basin during the past two years.

John Laing, president of the Wyatt Coal Co., residing in Charleston, W. Va., sailed March 6 from New York City for a Mediterranean tour. Mr. Laing, who is accompanied by his family, will visit the Holy Land, Italy, France and the British Isles.

S. Pemberton Hutchinson, president of the Westmoreland Coal Co., Philadelphia, and former president of the National Coal Association, is a passenger on the "Lapland," which sailed from New York March 6 on a Mediterranean cruise.

Oswald Cooper, lately connected with the Chicago office of the West Virginia Coal & Coke Co., who was recently operated upon for appendicitis, has resigned and will be connected with mining operations with which his father, Dr. Cooper, of Beckley, W. Va., is connected.

The resignation of **A. H. Lichty** as vice-president in charge of industrial relations of the Colorado Fuel & Iron Co. has been announced, to take effect the end of March. According to present plans, it was said, the vacancy created by this resignation will not be filled, the work handled by Mr. Lichty being distributed among other officials, in accordance with a reorganization policy which is being put into effect. Mr. Lichty has been with the Colorado Fuel & Iron Co. for the last five years. No announcement has been made of his plans for the future.

A. M. Bingham has resigned as secretary-treasurer of the Temple Anthracite Coal Mining Co., Scranton, Pa. It is reported that in the near future Mr. Bingham probably will embark in business with Frank Hemelright, formerly president of the Temple company, who is now on a trip to Honolulu. Mr. Bingham's resignation was announced soon after the retirement of his chief. Mr. Bingham continues as a director in the coal company in which he has been prominently identified for more than 25 years. Mr. Bingham resides at Dunmore, Pa.

H. G. Ecker, general manager of W. H. Bowater, Inc., 25 Broadway, New York City, returned from England last week on the "Mauretania."



William P. Jennings

William P. Jennings, recently appointed president of the Temple Anthracite Mining Co., Scranton, Pa., has also been elected president of the Temple Coal Co., Mount Lookout Coal Co., Lackawanna Coal Co., Ltd., and the East Bear Ridge Collieries Co., as well as a director of these companies. He succeeds F. H. Hemelright, who has retired. Before joining the Temple companies Mr. Jennings was for 38 years in the service of the Pennsylvania Coal Co. and the Hillside Coal & Iron Co., where he rose from door boy to general superintendent.

P. M. Snyder has announced the appointment of **J. F. Cornwell** as purchasing agent for the subsidiary companies of the Massachusetts Gas Co. operating in the Winding Gulf and other smokeless fields of West Virginia. Mr. Cornwell has been with the New River company since 1924 as assistant purchasing agent.

Otis Mouser, who for thirty years has been connected with the Wentz coal interests, has been named to succeed the late Col. D. B. Wentz as president of the Virginia Coal & Iron Co. and of the Stonega Coke & Coal Co., as well as chairman of the board of directors of the Hazle Brook Coal Co. and the General Coal Co. **E. B. Leisenring** is the new president of the Hazle Brook Coal Co. **Col. Ralph H. Knobe** has been chosen president of the General Coal Co.

Joseph P. Jennings, formerly superintendent of the Southern division of the Pennsylvania Coal Co. and the Hillside Coal & Iron Co., has been appointed general superintendent, in charge of all the collieries of the two companies. He succeeds his brother, William P. Jennings, who recently became president of the Temple Anthracite Mining Co. Other Pennsylvania-Hillside officials promoted are **Jesse Palmer**, mine inspector in the Northern division, who has been made superintendent of the Northern division, and **John M. Dobbie**, mine inspector in the Southern division, who has been named superintendent of the Southern division.

Traffic

New England Seeks Permanent Rail Rates from West Virginia

Petitions have been filed with the Interstate Commerce Commission by the New England Governors' Fuel Committee and the New England Traffic League asking that the present temporary rates on bituminous coal from southern West Virginia be made permanent. April 30 is the date set for the expiration of the emergency rates.

It is understood that New England's plea will be directed primarily toward the maintenance of rates on all sizes of low-volatile coal, while shippers of high-volatile coal in southern West Virginia seek permanent rates on that grade of coal to all Northeastern points, including New England.

The petitions will seek further hearings in I. C. C. Docket No. 15,006, commonly known as the anthracite substitute case.

Supporting petitions have been filed by the Boston Chamber of Commerce, Associated Industries of Massachusetts, Manufacturers' Association of Connecticut, Springfield (Mass.) Chamber of Commerce, New Haven Manufacturers' Association, Associated Industries of Maine, Connecticut State Manufacturers' Association, Associated Industries of Vermont, Providence (R. I.) Chamber of Commerce, New Hampshire State Chamber of Commerce and Portland (Maine) Chamber of Commerce.

The Kanawha Coal Operators' Association of Charleston, filed a petition with the Interstate Commerce Commission in Washington, D. C., on March 3, for a further hearing and for an order requiring the permanent continuance of through routes and just and reasonable rates to the six New England states, New York, New Jersey, Pennsylvania, Delaware and Maryland. The four points asked for in the petition are: First, a further hearing; that the commission by order require the respondent carriers to maintain the temporary or emergency rates; that they maintain permanently for the future through routes and joint rates on bituminous coal from the Kanawha-Coal River district and that the commission may enter orders for rates that are reasonable and just.

Stays Reconsignment Privilege On Anthracite at Detroit

In I. & S. 2619 the Interstate Commerce Commission has suspended from March 5 until July 13 several tariffs of the Grand Trunk and Wabash in connection with the reconsigning privileges on anthracite at Detroit, Milwaukee Junction, West Detroit and Port Huron, Mich. The suspended schedules propose to cancel free diversion and reconsignment privileges at those points and assess regular diversion and reconsignment charges in lieu thereof. Hearing is set for March 24 at 10 a. m., at the Detroit Board of Commerce Building, Detroit, Mich. The American Wholesale Coal Association is the principal complainant in this proceeding.

Coming Meetings

American Mining Congress. Southern industrial development conference, Hotel Peabody, Memphis, Tenn., March 15-17. Acting secretary, Henry M. Payne, Southern Division, American Mining Congress, Memphis, Tenn.

Heating and Ventilating Exposition at new Madison Square Garden, New York City, March 17-23. E. P. Frenz, Hotel McAlpin, New York City.

New England Coal Dealers' Association. Annual meeting, State Armory, Worcester, Mass., April 7 and 8. Secretary, E. I. Clark, 141 Milk St., Boston, Mass.

American Welding Society. Annual convention, 29 West 39th St., New York City, April 21-23. Secretary, M. M. Kelly, 29 West 39th St., New York City.

National Retail Coal Merchants' Association. Ninth annual convention, New Willard Hotel, Washington, D. C., May 17-19. Resident vice-president, Joseph E. O'Toole, Transportation Bldg., Washington, D. C.

Electric Power Club. Convention at The Homestead, Hot Springs, Va., May 24-27. Secretary, S. N. Clarkson, B. F. Keith Bldg., Cleveland, Ohio.

The American Mining Congress. Annual Exposition of Coal Mining Equipment, May 24-28, at Cincinnati, Ohio, in conjunction with the annual meeting of practical operating officials. Assistant secretary, E. R. Coombes, Washington, D. C.

International Geological Congress. The fourteenth congress will be held in Madrid, Spain, commencing May 24, 1926. From May 5 to 22 excursions of interest to the visiting delegates will be arranged. Information concerning the congress can be obtained from the secretary of the organizing committee, Enrique Dupuy de Lome, Plaza de los Mostenses, 2, Madrid, Spain.

Midwest Retail Coal Merchants Association. Annual meeting, May 25 and 26, at Kansas City, Mo. Secretary, James P. Andriano, St. Joseph, Mo.

Western Canada Fuel Association. Annual meeting at Winnipeg, Manitoba, Can., May 27 and 28. Secretary, W. H. Morrison, Winnipeg.

American Wholesale Coal Association. Annual meeting at Toledo, Ohio, June 7-9. Treasurer, R. B. Starek, Union Fuel Bldg., Chicago, Ill.

Association of Iron & Steel Electrical Engineers. Exposition and convention at Hotel Sherman, Chicago, Ill., June 7-10. Secretary, J. F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

American Institute of Electrical Engineers. Annual convention, White Sulphur Springs, W. Va., June 21-25. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

American Society for Testing Materials. Convention at Haddon Hall, Atlantic City, N. J., June 21-25. Secretary, C. L. Warwick, 1315 Spruce St., Philadelphia, Pa.

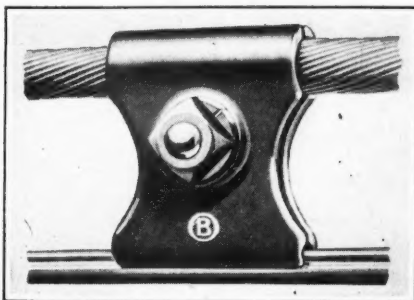
American Society of Mechanical Engineers. Spring convention at San Francisco, Calif., June 28-30. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

New Equipment

Clamp Makes a Flexible Trolley Line

A new duplex wire clamp lately developed by the Ohio Brass Co. is employed in the construction of a flexible type overhead for mine trolley systems. The feeder cable is strung above the trolley wire and also acts as the messenger wire from which the contact wire is suspended.

The construction possesses the same advantages as the high-grade catenary systems used on electrified railroads, namely, the wire is level without sag



Clamp Ties Feeder and Trolley

Trolley wire and feeder are held together by this clamp thus making a flexible trolley line with many feeder tap connections.

and free from the rigidity of other types of construction which develop excessive and destructive wear at hanger supports.

To make possible this type of overhead, at low cost and in practical form for mining conditions where low headroom is a factor, this new type of duplex trolley-feeder wire clamp has been developed. The feeder cable is suspended from a regular feeder sling or clamp attached to an insulated hanger. These duplex clips which grip the cable in the upper half and the trolley wire in the lower half are spaced at intervals on either side of the hangers. A bolt, nut and lock washer are used to tighten the grip after the clip is adjusted to position. This construction is said to be both permanent in character and economical in cost.

Gear-drive Gasoline Locomotives Announced in Four Sizes

A new line of gasoline gear-driven locomotives, ranging in size from eight to twenty tons, is announced by the Davenport Locomotive Works, Davenport, Iowa. In these, geared transmission replaces the roller-chain transmission and individual wheel drive of the present Davenport gasoline locomotives, although the manufacture of the original type will also be continued.

Many new features of design and construction have been incorporated, among which is a three-point suspension principle with cross equalizer to give improved tracking qualities. Semi-elliptic springs have been em-

ployed because of the wider distribution of stresses and better dampening of shock obtainable with this type. A fully inclosed, roomy, all-steel cab is provided for comfort and convenience in operation.

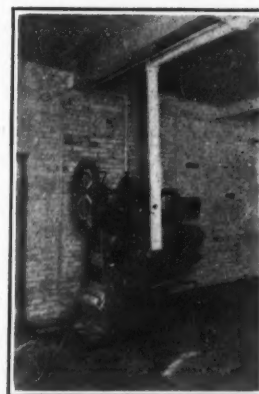
Open, accessible design has been used in these machines to facilitate quick adjustments and repair, and the construction is rugged and simple throughout. Various new mechanical features have been incorporated. The master clutch is a step jaw clutch which is always halfway in when the faces are engaged, thus eliminating the possibility of chipped corners on the clutch faces.

Both engine and transmission have individual force feed lubrication systems with pressure gauges in the cab. Alemite fittings are provided for the journals at the driving wheel.

Climax engines are used—six cylinders in the sixteen- and twenty-ton sizes and four cylinders in the eight- and twelve-ton—with four speeds forward and four reverse. Both speed and direction selection clutches slide on splined shafts for accurate, positive engagement and lock automatically in position. These advantages will be readily appreciated by practical coal mining men.

It Pumps Sludge Against Moderate Pressure Head

Careful preparation of coal by the wet process, that is coal washing, has brought its own problems in the way of sludge recovery and disposal. In the accompanying illustration is shown a diaphragm pump recently developed by the Dorr Co., of New York, and intended for use in pumping silt or sludge against a pressure head. Although this



Diaphragm Pressure Pump

As ordinarily constructed a diaphragm pump is intended to operate against little or no head. Machines of the type here shown, however, are operating successfully against heads up to 35-lb. per square inch.

machine is a new development it has already demonstrated its utility in this type of service.

This pump, known as the Dorrco, has been installed in several operations and is working against pressures ranging

up to as much as 35-lb. per square inch. Because of the design and construction of the machine, however, no noticeable strain is placed upon the diaphragm and the machine handles the coal sludge without difficulty.

With Line Oiler Air Drills Never Lack for Oil

A constant supply of lubricating oil is necessary for the up-to-date hammer drill if it is to work with maximum efficiency and minimum upkeep cost. If it were not for the human equation, the oil reservoir of the hammer drill itself would be amply large enough to supply this need, but as it is always necessary to take the human factor into consideration, the extra weight that would necessarily be added to the hammer drill to secure the increased reservoir capacity would be detrimental. For this reason, the Sullivan Machinery Co., Chicago, Ill., has designed a line oiler, which is shown in the accompanying cut, to meet this need.

OILER INSERTED IN LINE

This oiler, which is known as the "J-C" line oiler, consists essentially of an egg-shaped casting, of a net weight of 7 lb. and strong enough to stand the abuse of underground work, simple in principle of operation, and with an oil reservoir of sufficient capacity so that it requires only two fillings per eight-hour shift. The common method of using the oiler is to attach it with ordinary hose connections to the end of the air hose and then to use a short length of hose (8 to 10 ft.) between the oiler and the drill to be lubricated. It is possible to use lubricating oils of varying viscosity by merely changing the feed nozzle of the oiler. Experience has proved that hammer drills equipped with this oiler give better performance with less upkeep.

An arrow on the oiler indicates the direction of the flow of air through it. Part of the air is deflected into the oil reservoir, forcing the lubricant out through the nozzle into the air line. A plugged hole is provided for filling the oiler.

It is well recognized that adequate lubrication is essential to the proper operation of most machines. Rock drills are carefully constructed pieces of mechanism and sensitive in operation. It is, therefore, highly important that they be efficiently oiled not only in order that they may work properly, but also to reduce wear and maintenance charges.



Keeps Drill Oiled

The line oiler shown here should be as close to the drill as possible. It can be used with all pneumatic tools

Crawler Loader Has Large Capacity

A new crawler loader, known as the "Grizzly," has been placed on the market by the Link-Belt Co. of Chicago. This machine contains many improvements, in design and detail of construction, and is said to handle crushed stone, gravel, sand, phosphate and like materials at the rate of 1½ cu.yd. per minute, or about 140 tons per average hour.

This loader is a one-man machine. Its propulsion, operation, and care can be handled entirely by one worker of average intelligence. Four units make up this machine, namely, the elevator, the chassis, the power plant, and the crawler. The unit system of construction is employed enabling the operator to inspect the machine easily, and to make any adjustment or repair without tearing the whole machine apart.

Special attention has been given to the lubrication of moving parts, all of which are provided with Alemite fittings or grease cups placed within reach of the operator. All bearings and moving parts are large enough to keep wear to a minimum, thus assuring long life to the complete unit.

It is claimed by the builder that any one can learn to operate this machine with but a few minutes' instructions. It can travel forward and reverse; and turn right or left when traveling in either direction. The starting, turning, and stopping are all controlled by two hand levers, which automatically apply brakes when stopping. The elevator is controlled by separate hand lever, which operates a steel clutch. This disengages automatically when machine is started in reverse.

The buckets used in the elevator are of special design, with reinforced edges to reduce wear. They are spaced closely enough, on double strands of malleable iron and steel chain, to insure a steady delivery of material to the delivery chute the principle involved being that close spacing of buckets permits a lower speed of the elevator, with consequent less wear of parts.

Head and foot sprockets are made of manganese steel, cast in two parts, and clamped on hexagonal steel shafts. This eliminates troublesome keys. The hexagonal shafts are journaled, and are run in babbit bearings, oil-grooved, and provided with Alemite fittings. The driving wheel on the elevator head shaft is provided with a safety breaking pin. The chute at the

head of the elevator, as ordinarily furnished, is of the swiveling type. It operates through an angle of 180 deg. and can be controlled from the operator's platform.

The feeder consists of manganese steel paddles, securely bolted to the hexagonal foot shaft, and so arranged as to produce a steady feed of material to the buckets. Feeder adjustment and collapsing mechanism are both controlled by a hand wheel within reach of the operator.

The chassis is made of heavy angles, plate and channels, securely riveted together, making a substantial support for elevator and machinery. A large steel casting is riveted to the chassis, forming the connection to the front crawler shaft. The rear of the chassis is supported on a large steel bracket casting, pinned to the rear axle.

The power plant is a simple, compact, gasoline unit of 30 hp. at 1,200 r.p.m., equipped with a governor; an electric motor may be substituted if desired. The truck transmission has 3 speeds, giving 33 ft. or 66 ft. per minute in the forward direction, and 29 ft. in the reverse.

All driving and control machinery for crawler and elevator is housed-in. All shafts are of turned and all gears of cut steel. Bearings are bronze-bushed. The housing is dust tight, and partly filled with oil, which assures sufficient lubrication to all parts.

All drives are made by means of roller chains, running on steel sprockets. All are protected by sheet steel guards. The crawler is of channel and plate construction, riveted together, making a rigid housing for sprockets and idlers. The sprockets are of the self-cleaning type, made of steel, bronze-bushed. The treads are made of special heat-treated steel, cast in one piece, 11 in. wide, 11½ in. pitch, and run on cast steel idlers, also bronze-bushed, with large chambers for lubrication. A special design of shoes and sprockets guarantees self-cleaning. The rollers are of large diameter, and keep the bearings up out of the dirt.

Association Activities

Open billing of coal was vigorously condemned at a meeting of the Chicago Wholesale Coal Shippers' Association held Feb. 26 at the Illinois Athletic Club in Chicago. T. C. Irwin, of the Abbott-Irwin Coal Co., introduced a resolution, which was unanimously adopted, protesting against the shipment of coal without orders. The practice was held to be one of the crying evils of the coal industry and the Chicago wholesalers desired to go on record as definitely opposed to it.

Obituary

William M. Strachan, widely known in Indiana mining circles, died Feb. 17, at Rochester, Minn., where he had gone for treatment following an illness. Mr. Strachan was superintendent of the Fort Harrison Mining Co., of Terre Haute, having under his supervision the Wabash, Talleydale and Bardyke mines.